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ABSTRACT

In an effort to understand the schooling process, a longitudinal study was conducted of children enrolled in three elementary schools. Children entering first grade in a middle class white school, an integrated lower class school, and an all-black lower class school were followed to the end of third grade. This final report of the study presents eight chapters. Chapter 1 raises basic questions about schooling, including considerations of policy and research strategy. Chapters 2 and 3 review psychological and sociological research bearing on schooling. In chapter 4, an heuristic model of the schooling process, incorporating psychological and sociological variables, is offered. This model is elaborated in chapter 5, and the sets of models designed for each of the three schools are described. (Specifically discussed are six cyclic models reflecting the schooling process and the rationale for model constituents and structure.) Parameter estimation, and discussion of the estimates, is the topic of chapter 6. Models described in this chapter focus on the process of schooling in order to clarify two cognitive outcomes (teachers' marks in reading and arithmetic) and four affective outcomes (teachers' marks in conduct and childrens' expectations in reading, arithmetic, and conduct). Chapter 7 comments on the significance of these outcomes, and chapter 8 presents an overview of the study. It is suggested that the models account for both cognitive and affective outcomes in all three schools. In addition, it is asserted that somewhat different processes lead to achievement and to affective development in each educational setting. (BJD)

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FINAL REPORT

SCHOOLING OF YOUNG CHILDREN: COGNITIVE AND AFFECTIVE OUTCOMES

National Institute of Education Project No. NIE-G-74-0029

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SUMMARY

An extensive case study of all children enrolled in the first three grades at three elementary schools, this research focuses on the schooling process. Children entering first grade in a middle-class white school, an integrated lower-class school, and an all-black lower-class school were followed continuously to the end of grade three.

Cyclic structural equation models are proposed to explain affective and cognitive outcomes of schooling in three social milieux. FIML estimates of the models, taking measurement error into account, suggest that marks in reading and marks in arithmetic (cognitive outcomes) as well as children's marks in conduct and academic self images (affective outcomes) can be rather well accounted for in all three schools and also that somewhat different processes lead to achievement and to affective development in the three places. On the other hand consistency in the basic structure of the models from one year to another, and from one school to another, as well as agreement between subsample replications, document the reasonableness of the models. The research points to both the feasibility and the usefulness of studying schooling early in children's school careers.

ACKNOWLEDGMENTS

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N.B. Throughout this report for simplicity a single possessive or pronoun will be used. The reader should understand "his/her" for "his" and "he/she" for "he" and so on.

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CHAPTER 1

BASIC QUESTIONS ABOUT SCHOOLING

Pupils, teacher, learning. Schooling occupies a dominant place today in children's lives in almost all societies. This book is about schooling, chiefly about how very early school experiences may affect young children.

Schooling, in addition to providing a vocation for persons too young to work, is a cornerstone of stratification. Although the question of the extent to which schooling supports occupational stratification has not been answered to everyone's satisfaction, clearly it could have some substantial role in the process. Knowledge is lacking, however, about exactly how schooling effects occur and under what conditions children can better or worsen their chances for success in school, even though such knowledge is essential for understanding stratification in industrial and developing societies more generally.

Until well into the present century many Americans believed schooling was the chief remedy for inequalities in social and economic opportunity. They thought that the American dream would eventually be achieved if all children could go to equally good public schools with merit standards. In other words in a just system of contest mobility, qualified individuals would inevitably obtain their deserved social and economic rewards and rise to the top. But leaders and laypersons alike in the last two decades have become increasingly disturbed by the failure of children from low SES groups (roughly the bottom 15% of the population in terms of income) to attain an education that will boost their life chances. Some persons, in fact, see danger that this 15% of the population will become a permanent "under-class" characterized by an absence of steady employment, a low level of education and work skills, living on welfare payments, and social isolation from the remainder of society (Havighurst, 1970).

There is ample reason to be disturbed. The tendency for members of disadvantaged groups to underachieve in school is by now well-documented. Whether one looks at large national surveys or at single classrooms, the evidence is clear--blacks, Spanish-American, Chicanos, and American Indians do not profit as much from school as majority students. There is also evidence that educational attainment (number of school years completed) is more closely related to social class or home background than to measured IQ. These facts are unsettling to persons who live in a country dedicated to social equality, for the clear implication is that society's rewards depend more on ascription than on achievement. Says Coleman (1966:325, 296-97), "Schools bring little influence to bear on a child's achievement that is independent of his background and general social context." and "...our schools have great uniformity insofar as their effect on the learning of pupils is concerned."

Coleman's conclusions, although sharply questioned, have not been overturned, even though there has been much educational research since 1966 directed at the same questions he studied. The conclusion that most minority-group and low SES children are underachievers is still valid. But to document this underachievement over and over again is not useful. In fact, it is an activity coming to be sharply resented by the underachievers themselves. The time is past when a black principal, for example, will welcome another research team into his school. Instead the time has come to find out how the achievement process works, what specific mechanisms underlie schooling, and to answer these questions robustly.

It is a fact that relatively few lower-class persons use education as a route to upward mobility. To review the many explanations put forward to account for the correlations between social class and school achievement is a huge task, far too big a task for us because it is one that would take a book in itself. We can note, however, that explanations tend to polarize around either a genetic or an environmental base. To focus directly on these issues may be premature, however, until one looks carefully at the schooling process to see what, in fact, it actually consists of. If well understood, schooling might be turned in a direction to counteract *either* hereditary or environmental deficits.

As an example of the possible benefits to be derived from such an approach, consider recent trends in treating the severely retarded. A very large number of them have been successfully deinstitutionalized and now live in the community. Some, such as those with Downs' syndrome, are now being intensively schooled along with their families from the time of birth. Clearly, for reasons of organic disability, there is a ceiling the scholastic attainment of retarded children, including those with Downs syndrome, yet a better understanding of the schooling process, in particular getting an early start and schooling parents and siblings along with the retarded child, has permitted many such persons to become useful, self-sufficient, and less of a burden on society.

By the same token, it appears that a promising route to improving the life chances of underachievers lies in the direction of a better understanding of the schooling process. The problem is not a "minority" problem, it is a scientific problem. The folly of focusing narrowly on black-white differences, or any other majority-minority difference, should be apparent from the observation that some minorities, notably Orientals, as a group do well in school. Also from the observation that some individual blacks, some individual Indians, some individual Hispanics do well in school. Schooling occurs in schools. The process of schooling, however, and not schools themselves should be targets of study.

Schooling

What is schooling? First, it is the process by which children are made able to read, do arithmetic, and acquire competence in the other academic subjects. But schooling also fosters affective and social development, which are much harder to define than cognitive development. Affective outcomes include developing a stable self-image, acquiring the means of interacting with classmates and peers, learning social customs and mores. Later we will develop in great detail our ideas about some of the cognitive and affective outcomes of early schooling. Here we will say merely that our focus will ultimately be on children's achievement in reading and arithmetic as cognitive outcomes, and on their marks in conduct and expectations for their own academic success as affective outcomes.

In order to develop and test our ideas about schooling we undertook three extensive case studies in which we followed a large number of children through the first three grades of three elementary schools. Each case study focused on a particular school: a white middle-class suburban school, a lower-class urban integrated school, and a lower-class black urban school. Each school is unique, yet in our view each serves as an exemplar of a kind of school presently found in many areas of the United States. Since it seems plausible that long-term cultural learning opportunities may lead to stable differences in both attainment and self-image, we hoped to gain insight into what affects young children's early school experience by looking in detail at what happened to children as they progressed through the first three grades in each of these schools. We wanted to see, among other things, whether the process of schooling was different depending on the social context. Our choice of variables and hypotheses was based on a number of considerations arising from theory and from identification of particular gaps in the empirical literature in sociology and education, but was mainly motivated by our wish to understand the basic nature of the schooling process.

The plan in this chapter is to give some general background for the schooling issue, including considerations of policy and of research strategy. In the following two chapters, we will enlarge on the psychological and sociological bases of the model, and then present a heuristic model which represents our view of the schooling process. In later chapters we will ground the heuristic model empirically and propose formal structural equation models to describe the schooling process. Finally we will use data gathered in the three schools to estimate the models.

"Null" School Effects?

Perhaps more than any other, the puzzle of status attainment has captured sociologists' attention over the past decade, beginning with the Coleman (1966) report, already alluded to, and with Blau and Duncan's (1967) proposals for models of status attainment. Analysis and reanalysis of several large American data dets have modified and elaborated the basic model proposed by Blau and Duncan, particularly with respect to the specification of variables antecedent to educational attainment. Among data sets used for such analyses, those of particular note are the Equality of Educational Opportunity data (Mosteller and Moynihan, 1972), the Project Talent data (Jencks, 1972), several sets of data for the state of Wisconsin (see e.g. Hauser, 1971; Sewell, Haller, and Portes, 1969), and a national sample procured by the Educational Testing Service (Alexander and Eckland, 1975). Without exception these studies have led to a unitary conclusion: altogether a rather small amount of variance in status attainment is explained (typically in the neighborhood of 20 percent), and the contribution of school factors to this variance appears to be small, some think negligible. This conclusion, based on empirical investigations in the United States, is echoed in a recently reported study of the children born in Warsaw in 1963 where school and other factors could be clearly separated from one another (Firkowska, Ostrowska, Sokolowska, Stein, Susser, and Wald, 1978). So, despite increasingly sophisticated models, and big and carefully measured samples, at this time one can say only that, on the basis of a large amount of evidence, school influences appear relatively unimportant.

Some take comfort in these statements, interpreting them as evidence for the robustness of human learning. After all, they argue, if learning of important life skills were so fragile a process as to be swayed by every environmental breeze, the human race could hardly have survived generation after generation (see e.g., Stephens, 1956:469).

Yet it is hard for many other people to accept a conclusion that schools make little difference. For one thing, this conclusion flies in the face of all society's myths about the "right school." For another, if schools really do not matter, it is hard to account for large cross-national differences in mathematics or reading proficiency. (See Anderson, 1967). That schools make little difference is a conclusion that people are reluctant to draw for other reasons as well, reasons that may have more to do with the psychological makeup of human beings than with the objective evidence. Null findings, whatever their nature, are alike psychologically distasteful, unsettling, disconcerting, and, of course, ultimately unverifiable.

For all these reasons, and others, the issue of "null school effects" is not likely to go away soon. Seasoned investigators, in fact, continue to cast about for alternative hypotheses, hoping to catch the influence schools "should exert." Two such hypotheses have been articulated lately: (1) dynamic models should replace the (so-far) static models serving as paradigms for research on school effects because the static models may mis-specify, and therefore miss, effects that are principally dynamic in nature(see Sorenson and Hallinan, 1977); (2) school effects may be substantial in the early school years and gradually subside, but since practically all sociological research on school effects has focused on the secondary school, any effects present earlier may have gone unnoticed (see Alwin and Otto, 1977). To our knowledge few empirical data exist to inform either hypothesis. Actually, of course, both hypotheses, as well as others, are plausible. That is, schools may exert a significant impact upon children mostly early in their academic careers through a dynamic or feedback process. The functional form of models of the schooling process is certainly debatable (see Hauser, 1978), but the desirability of multiwave data is not: a continuing process like school learning is unlikely to be revealed with data gathered at only one or two discrete time points and analyzed by statistical techniques suitable for cross-sectional survey data. Luecke and McGinn (1975), particularly, have faulted the use of cross-sectional data to estimate structural models of schooling, and a recent paper by Cook and Alexander, (1978) suggests that the bias introduced in some parameters is so large as to obscure cause-effect relations.

Our view is that, in addition to all of the above, people have been asking the wrong questions about schooling. A neglected aspect of schooling is process: what occurs while pupils are in school or what do schools do to pupils that lead pupils to achieve? The several large-scale studies mentioned above, including the Coleman report and others like it, suggest that schools themselves contribute little to achievement. These studies, however, do not attempt to explain the schooling process. For example, Coleman and his associates investigate library size but do not explicitly specify how library size, or other school facilities, could lead to pupil achievement. Although pupil background is a relatively important explanation for variance in pupil achievement in all the large scale studies, no study addresses directly how such "background" is converted into attainment.

The psychological and educational literature, on the other hand, is replete with small-scale studies that focus on some small aspect of pupil-teacher relations, for example, on how teachers who hold high expectations for certain students treat those students. The psychologically oriented studies, however, typically focus on one or a very few psychological variables. At this time most do not shed much light on the process of schooling either.

The large- and small-scale studies are at opposite poles in a number of other respects as well; the large use probability samples, the small "grab" samples; the large often involve time frames of years, the small a few days or weeks; the large deal with aggregate standardized achievement levels by school, the small with individual behavior and performance.

Both large and small studies have one feature in common, however; both leave unspecified the actual nature of schooling--how background variables and individual characteristics are jointly converted into attainment within the social structure of the classroom. The Wisconsin studies, to take an example of large-scale research, show that home background explains considerable variance in educational attainment (Sewell and Hauser, 1972, 1975). The process by which background exerts its influence, however, is moot. Do farmer fathers proselytize their sons to become farmers also; do fathers who are in the professions read a lot and thereby encourage their sons to read also; or what? Similarly, to take examples of small-scale research, many investigators (e.g., Brookover, Patterson, and Shailer, 1962; Brookover, Thomas, and Patterson, 1964; Brookover, LePere, Hamachek, Thomas, and Erickson, 1965; Brookover, Erickson, and Joiner, 1967) report that low self-image is correlated with low achievement. We do not know, however, even whether low self-image is a cause or a consequence. That is, a low self-image could discourage a child from making the effort necessary to achieve or, on the other hand, poor achievement could lead the child to have a low opinion of himself. Usually in any given piece of research either explanation is equally appealing.

We presently have, then, little knowledge about the actual schooling process, for example, what links social structural variables like the cultural context of the school to individual-level variables like the reading attainment of students. Few studies fall in what might be termed the "mid-range," between the macro-structure level and the individual level of theorizing. To indicate the path that such mid-range studies can take, and the promise they hold, several brief reviews below summarize some extant studies, mostly very recent, which can be classified as falling in the mid-range. They elucidate the actual schooling process better than much previous research because they link social structural variables to pupil attainment. (Studies not discussed in detail but pointing in the same direction include those by Hanushek (1972), Sewell, Haller, and Straus (1959), and Wilson (1959). See also McDermott (1977).) Drawn from several different literatures, these studies are worth discussing separately here because they make clear what is meant by a "mid-range" study and also the likely fruitfulness of this level of analysis.

Mid-Range Studies

Pedersen, Faucher, and Eaton (1978)

In a research project of "unconventional methodology and unusually long duration" in a disadvantaged urban neighborhood Pedersen, Faucher, and Eaton (1978) examined the impact of classroom teachers on children's subsequent adult status. They happened to notice that IQ change varied by first-grade teacher, and so altered the original thrust of their investigation from being one directed at IQ change to one directed at teacher effects. Specifically they found a positive correlation between children's exposure to one first-grade teacher (Miss A) and their adult success measured 25 years later.

In pursuing this finding, Pedersen et al. found that a number of measures distinguished between the pupils of Miss A and those of other first-grade teachers while all were still in grammar school. Perhaps most noteworthy, Miss A's pupil's did better in second grade, and subsequently this superior performance was linked to higher scores on a number of personality indicators measured during the rest of elementary school. In fact, their achievement was higher in all grades through seven, their level of effort was consistently higher in the first seven grades, and they received higher ratings in leadership and initiative over that period as well. Later, when Miss A's pupils were between 13 and 30, they continued to excell compared to other pupils from the same school, for 57% completed tenth grade or more compared with a 42% completion rate for pupils of other teachers. Using a summative index of adult status based on six variables (type of home, rent paid, educational attainment, occupational prestige, appearance of house, and personal appearance on respondent) as the ultimate endogenous variable, a path analysis shows a statistically significant and relatively large direct effect linking the children's first-grade teacher to adult status.

One plausible alternative explanation for these findings is that selective factors operated to give members of Miss A's class some unknown advantage from the start--perhaps Miss A received relatively more children from favored social backgrounds than the other teachers, for example. Several variables known to have high positive correlations with both SES and IQ (number of children, father's occupational status and whether or not the family was ever on welfare) were included in the path analysis, however, and thus both initial SES and/or IQ are rather effectively controlled. Personality differences cannot be effectively dealt with.

The evidence must be weighed cautiously--the sample is small and the particular characteristics or teaching methods of Miss A are left unspecified--but the study is contrary to ideas that teachers have negligible effects and is provocative because it hints at what might turn up in research on students' earliest school days. Possibly getting students off to a flying start in first grade is critical for the remainder of their educational careers.

Rist (1970)

In contrast to the Pedersen et al. study, which concluded that children of substantially similar backgrounds exhibited different levels of success because they were assigned to different teachers, Rist's study focused on how differently one teacher may treat various pupils in a single class. He observed how a black kindergarten teacher treated black children over an entire kindergarten year. He observed that children judged by the teacher to be of relatively low status were placed farthest from her in the classroom, and as the year wore on, they received much less instruction. In fact, pupils were treated in accordance with their social backgrounds which the teacher was able to gauge by a number of indicators--quality of dress, speech patterns, even body odor.

Rist's most disturbing conclusion is that the teacher's expectations were set in concrete by the eighth day of school. Having once determined shortly after the beginning of school that a child was of low status the teacher held fast to that judgment. Even worse, judgements of the child's first teacher were not contradicted by later teachers. Rist calls this a "caste system", because the social system in that school allowed for downward but not upward mobility, and once classified as a person who could be expected to do poorly, the child could never escape his fate.

One thing about Rist's report deserves emphasis, namely, it's methodological weakness. Rist has provided us with a very rich, but one-shot case study, comprised of unsystematic observations of unknown reliability. The data are largely impressionistic and anecdotal. On the other hand, he suggests more clearly than others how teacher effects may be mediated in the classroom, and why, for instance, Hanushek (1972) could find that some teachers are better for anglo than for Mexican-American children.

Rist investigated how initial teacher's expectations and early social interactions between pupils and teachers determine the social organization of the class, and then how achievement may respond to social organization. His work is unique in its comprehensiveness. His work is of interest to us also because it shows the longer-term consequences of experience very early in the school career.

Berkeley (1978)

In a careful observational study carried out in the same three schools from which data for this book were collected, Berkeley (1978) observed the daily activities in six kindergarten classrooms (two per school). The kindergarten classes met in two urban schools, one all-black, the other integrated, and one all-white suburban school. Trained observers recorded minute-by-minute how teachers used their time, whether in cognitive, social learning, procedural, or child care activities involving pupils, or attending to interruptions, activities not involving pupils. Also the observers tallied the number of interactions between teacher and pupils when the teacher praised or reprimanded. An intensive period of observation, every day for 12 successive school days, occurred at the beginning of the school year. Thereafter observers attended class twice a month for the first half of the school year. This is a mid-range study, where the unit of analysis is the classroom, and it seems to be the only study providing a time analysis of teacher activity or a careful observational analysis of kindergartens.

The findings run counter to a number of conjectures frequently encountered, among them that kindergarten teachers of middle-class children spend more time on cognitive activities than teachers of lower-class children. In this research middle-class teachers spent less time, but not significantly less, on cognitive activities. Children in inner-city schools, the thinking has been, must learn how to follow directions, accommodate themselves to school routines, and receive other similar training that steals time from training directed at reading readiness, learning numbers, and other pre-academic topics. Not so, at least in the schools observed. In fact, teachers in the suburban schools spent significantly more time on procedural activities (54% in the suburban school compared to 44% and 33% in the other two schools), and when questioned about their allocation of time to procedural activities, they stated that they emphasized teaching of routines--learning to raise hands rather than call out, for example--because they felt that successful learning of academic subjects in first grade would proceed better if children were thoroughly accustomed to school practices.

Another myth is called into question by Berkeley's study, namely that inner-city teachers must deal with larger classes and therefore that children receive less attention from adults. Actually effective class size was considerably larger in the suburban school than in the other two schools (23.5 vs. 15.1 and 13.6, respectively). The data reveal that the absence rate and the transfer rate for the inner-city schools exceeded the rate for the suburban school. Therefore class size is considerably smaller (due to absence), but facing a smaller number of children on the average, inner-city teachers were confronted with a group of children whose membership varied from day to day. Perhaps of 14 children present one day, only 10 had been present the day before. Maintaining any continuity in classwork is extremely difficult when the young pupils are more or less transient.

The schools did not differ in the amount of teacher's time required for child care and so the study fails to support hypotheses that black or low-income pupils come to school less well prepared to handle school routine than white or middle-income pupils. Others (see e.g., Gintis (1971) and Berg (1970)) have argued that socialization in school, such as training in procedures, rather than academic achievement may explain the relationship between schooling and occupational attainment--the "hidden curriculum" of the middle-class school. Berkeley makes it a little clearer what that curriculum actually consists of.

The study draws no conclusions about children's achievement but does shed considerable light on classroom process. It suggests why certain milieux, even as early as kindergarten, could add to, or detract from, schooling outcomes.

Entwisle and Hayduk (1978)

In a case study of two schools which in many ways served as the stage for our present investigation, we collected data on children's expectations, their parents' expectations, and their marks in reading, arithmetic, and conduct over first and second grades. The study was exploratory, one purpose being to see whether such young children could be studied at all in this manner. Another purpose was to explore whether variables such as IQ and sex related to expectations and whether expectations in turn related to achievement.

There turned out to be very different marking norms in the middle-class white school as compared to the lower-class integrated school despite the rather small difference in average ability between children starting school in the two places. Also there were large differences between schools in the expectations children held for their own performance in reading, arithmetic, and conduct. Children in the lower-class school (studied only in first grade) did not process evaluations so as to bring their expectations into line with their performance, whereas children in the middle-class school shifted their expectations over time and brought them more in line with performance. In neither school was it clear how children formed their expectations at the start but it was clear that expectations did not crystallize as soon after school entry as some investigators (Rist) had hypothesized.

This research will not be discussed further here because the findings will be replicated and extended later in this book. It is, however, another recent example of research on schooling with young children where the schooling process is made clearer, particularly in relation to (classroom) teacher's expectations and evaluations.

Murnane (1975)

In an empirical analysis of the relations between school resources and the cognitive achievement of black inner city children in a large urban school system (New Haven) where reading and arithmetic performance were examined in second and third grade, Murnane gathered longitudinal data for individual pupils. He then related the student data to detailed information on individual classroom teachers. To allow for effects of family or background factors outside of school, he included as exogenous variables in his models data on rental costs of students' housing and on whether or not the child came from a female-headed household, thus effectively controlling on these factors. A total of seven teacher characteristics were studied, four related to the teacher's training and three based on demographics.

It turned out that during a teacher's first few years of teaching, there were successive increments in students' achievement, and then something of a decline. Teachers with several years of experience were markedly more effective than first year teachers but after about five years, additional experience did not lead to more effectiveness. With children of both sexes male teachers were consistently more effective than female. Generally mathematics achievement responded more strongly to teacher variables than reading achievement.

Overall Murnane's analysis provides evidence that individual teachers do make substantial differences in second and third grade children's achievement. Presumably knowing exactly where to look, further studies employing direct observation could detect the specific factors that differentiate experienced from inexperienced teachers.

Summers and Wolfe (1977)

Using randomly selected data for sixth-, eighth-, and twelfth-grade students in the Philadelphia School District, Summers and Wolfe studied composite achievement over a three-year period. Their most interesting findings are the ones on teacher variables: when they studied rating of teacher's college, experience, and National Teacher Exam score, teacher by teacher rather than averaged by school, each of these variables proves to be a significant predictor. The same is true of class size--averaged by school it seems unimportant, but teacher by teacher, it proves efficacious.

A number of conclusions refer particularly to low-income or minority-group students. For example, students from lower-income families benefitted most from teachers who had attended higher-rated colleges. Third-grade students who were very much below grade level did best with teachers who were relatively inexperienced.

Small class size helped low-achieving students but hindered high achievers. Smaller schools seemed to be generally better, but especially for blacks. Also all students seemed better off in racially balanced (40 to 60% black) than in highly segregated schools.

Again, as in Murnane's analysis, there is strong evidence that teachers do make a difference, when the unit of analysis allows those differences to emerge.

Brookover, Schweitzer, Schneider, Beady, Flood, and Wisenbaker (1978)

In a random sample of Michigan public elementary schools, questionnaires were administered to fourth-and fifth-grade students, their teachers and principals, and then used as the basis for evaluating "school climate." There were large differences among the schools in the number of students who had mastered the basics of reading and arithmetic, with mastery ranging from 42 to 88% by school. The portion of this variance in achievement explained on the basis of socio-economic and/or racial composition of the schools was about the same as the proportion explained by "school climate"--a mix of measures including student's sense of academic futility, the student's sense of evaluation and expectations, academic norms, and student's perception of "teacher push" and norms. The investigators say (p. 316):

> ...school composition does not necessarity determine school climate...predominantly low SES and minority schools are more likely to be characterized by a high sense of student academic futility, low academic norms, and low expectations for and evaluations of the students...but these composition variables do not invariably produce such climate differences....the evaluations and expectations made of students and students' perceptions of these evaluations and expectations and their feelings about possible success in the school are clearly related to the students' achievement.

This study again points to the relevance of an analysis in terms of classroom units--teachers matched with their students--and is the only good example we have been able to find of the use of evaluations and students' perceptions of evaluation as factors explaining achievement. In Chapter 3 the importance of evaluation in relation to expectation will be further pointed up as a prelude to our development of a heuristic model including both in Chapter 4. This study is another example of a recent investigation where a multivariate model together with data from elementary children reveals sizeable school effects net of background variables. In fact as far as both the variables and the style of analysis are concerned, this paper addresses issues we see as central in the process of schooling.

These studies all focus on events within schools. Either teachers with particular characteristics are compared with other kinds of teachers or an analysis of classroom interaction is undertaken in an effort to show how teachers may act within the classroom to produce differences in achievement. Without exception the studies deal with students in the early grades of school and come up with exciting findings. They suggest, contrary to the macro-studies of Coleman and others, that schools do have substantial effects on their clients and moreover give a number of clues as to how such effects are mediated.

In the remainder of this chapter we will pull together a number of our own ideas suggesting why study of young children's attainment may hold the key to understanding school achievement more generally.

Early Life Events

One characteristic common to the midrange studies just reviewed is that they focus on students in the elementary grades. They thus employ a strategy recently advocated by Alwin and Otto (1977), who assert that to gain a better understanding of the nature of school attainment, it may be necessary to observe children early in their school careers, before secondary school. The fact that these midrange studies, without exception, focus on elementary children is certainly no accident.

To look at the schooling process, a self-contained classroom offers obvious advantages. A child interacting with a single teacher offers a site in which some critical variables can be unequivocally measured. For example, in our own earlier work, we chose to study young children because we could assess how teachers' marks and the impact of these marks upon the child and his family affected both the child's subsequent achievement and his ideas about that achievement. In a secondary school, by contrast, students receive marks from many teachers and it would be difficult to tease out the effect of feedback from any particular teacher. But there are other stronger reasons to adopt a strategy of studying young children, and some of these are elaborated below.

Folk wisdom stresses the importance of events early in the life cycle. There is more than a kernel of truth in what Rogers and Hammerstein wrote in the 1940's:

> You've got to be taught
> Before it's too late
> Before you are six or seven or eight

Child development theorists express the same notion less succintly. For instance, Bloom (1964:110) says: "The first period of elementary school (grades 1 to 3) is probably the most crucial...for the development of general learning patterns... [and] all subsequent learning in the school is affected and in large part determined by what the child has learned...by the end of grade 3." Likewise Kagan and Moss (1962:272) conclude that "...for some children the first four years of contact with the school and peer environments...crystallize behavioral tendencies that are maintained through young adulthood." In fact, a reason commonly given to account for the superior school attainment of middle-class children is that their pre-school environments are superior, and the advantage they possess when they begin school is one that less fortunate children cannot ever make up.

By the end of the third grade children's achievement levels are stable--how well children are doing in school at that age is a good long-term indicator of school performance. In Húsen's (1969) large cross-national study, for example, intelligence scores and teachers' rating in third grade were both good predictors of children's subsequent educational careers, and Kraus's (1973) data, which describe children in New York City over a twenty-year period, showed the most significant predictor of adult status to be the score obtained on the third-grade reading achievement test. There was a high correlation between this score and all subsequent reading, mathematics, and intelligence test scores.

Early events are clearly of considerable importance. Why? For one reason, because of a self-fulfilling prophecy: a child's expectations for his own performance shape that performance, then the performance is evaluated, and subsequently the evaluations feed back to modify the child's expectations. Once set in motion, this cycle is hard to break. If a child's first report card rates him low on reading, his initial high expectations may be shattered or his low expectations confirmed.

He may then make little effort or be given little opportunity to prove himself. One evaluation, in this case a first mark that happened to be low, can cause the child to treat himself and to be treated so as to impede learning. Then the kind of treatment he comes to expect is altered and his performance keeps pace. The low reading mark may have had no "real" basis. The teacher may have given the mark merely because she was required to issue a certain percentage of low marks. Such early events, however unrelated they might be to the child's actual potential, could nevertheless have profound implications for a child's academic career because they trigger a vicious circle of later events.

Another reason for studying children early in their school careers is that, without exception, future gains in achievement are proportional to present levels of achievement. Children who know the most when they begin school are the ones who learn the most during the year. (Coleman termed this "fan-spread" to emphasize that groups initially disparate become increasingly so--fan out--over time.) Fan-spread led to outcomes for Sesame Street educational programs that some policymakers did not foresee: the viewers who were relatively more advantaged derived more benefit than the less advantaged, while, of course, the aim of the program was to overcome the crippling deficits in rudimentary academic skills of economically disadvantaged children. Instead, the advantaged children increased their lead and so the program exacerbated the very problem it was designed to remedy. The extent of fan-spread may come as a shock to some readers. By the time children leave grammar school their variability in basic reading and mathematics skills commonly ranges from a first grade to tenth grade level of competence, over 9 years. Some seventh-graders do as well on SAT tests as the most talented 11th or 12th graders (see e.g., Stanley, 1976). Clearly if we want to study how schooling affects children, it would be advantageous to begin research early, when the spread among social groups was at a minimum.

What could explain the widening differences in achievement over time? One explanation is that children who learn the most in one time period, say the first semester of first grade, have the capacity, personal style, motivational set, or whatever it takes, and that these personal qualities will continue to ease their path in the next semester. Another explanation hinges on the fact that the high achievers have already acquired better skills than moderate or low achievers, so their future mastery of any hierarchical series of tasks is made easier. For example, those children who read better can look up words in the dictionary better. Superior readers can also better employ reading as a subsidiary skill in the service of acquiring arithmetic or social studies skills.

The pivotal nature of early attainment, especially in reading, is clear. The school curriculum in every area and at every level hinges on reading skills. Reading is the first topic of instruction and in the first three grades occupies the largest fraction of school time. By the latter half of elementary school, children are launched into achievement trajectories which are seldom breeched. Silverstein and Krate (1975:230) say:

> Middle-class behavior and reading readiness become inextricably intertwined in kindergarten or first grade, mutually reinforcing each other and determining a child's class placement. If the child in kindergarten or first grade shows signs that he is ready to read, he stands a chance of going to the best or second-best class in the grade, where his peer contacts and his teacher are likely to influence him to become more adult-oriented and a

> better reader. If the child shows little reading readiness in kindergarten or first grade (as was true, we found, of peer-oriented children), his chances for academic success are virtually nil, for he will almost certainly be streamed into a class below the top two on grade, where he will associate mostly with other children who suffer the double jeopardy of a strong peer orientation and little readiness to read. Thus, by the time the child is eight or nine years old his ability (or lack of ability) to read and his adult (or peer) orientation have usually mutually reinforced each other through a sorting process that the school directs.

These authors continue by pointing out that by 8 or 9 years of age the child must make a commitment to a middle- or lower-class life style.

Actually since the impact of instruction in higher grades is largely conditioned by the pervasive effects of reading ability, a poor reader will have a hard time even if middle class. A mathematics lesson in seventh grade might be understood by all children who had 7th grade reading ability, but be obscure to those with less reading ability even though their mathematical aptitude is high.

Another thing to take into account is children's experience in the system. By the time a child has spent a few years in school, he or she is refractory to most modifications. Children develop a ho-hum attitude. Whereas a particularly good teacher or good information feedback might really improve learning early in school, later on children may ignore or be unaware of changes in the system.

Still another reason for looking at early schooling is its relation to the transfer of status from one generation to the next. If sons of farmers become farmers themselves, one reason may be that their educational background by the time they reach choice points in the system permits them no alternatives. The child who attends a rural elementary school for example, will find it next to impossible to do well if he transfers to a place like the Phillips-Exeter Academy, but he might need a superb secondary education to have a real chance to get a degree from Harvard or Yale. Here the problem may not turn so much on what happens in the elementary school as on what does not happen. He is not introduced to spoken foreign language instruction, music appreciation, or reading for pleasure in the elementary school. With no role models at home, the child does not learn to value academic habits such as considering many alternatives before solving a problem or even the joys of building and maintaining his own library. By the time he enters high school, his skills are not likely to be competitive with skills of classmates who mixed with children from homes where high educational aspirations were encouraged.

For all these reasons and others, the schooling process may be much easier to understand at a point close to the time when children enter the educational system.

Summary

In reviewing both what is known and what remains to be discovered about causes of children's school achievement we have reached two major conclusions. The first is that, although the social stratification system in America is presumed to respond to schooling variables, so far it is not clear by what means it does respond or to what extent it could respond. We lack knowledge about the actual process of schooling. Second, several investigators have lately voiced the opinion that it might be fruitful to study primary age children (a group curiously neglected by sociological researchers), and some recent studies point to the usefulness of this strategy. Suitable data archives for such research are lacking. The available data suggest that children tend to locate themselves in achievement trajectories early in their academic careers and also that social structural variables are critical in this sorting process. What needs to be determined is how social structure and the schooling process interact.

In an effort to understand the schooling process, we undertook the research reported in this book. Part of the task consisted of rethinking the major strategic problems affecting research on schooling. Some of these problems have already been mentioned; for example, that the unit of analysis may obscure or elucidate schooling phenomena, and that children of one age may be more suitable candidates for study than those of another. The next part of the task consists of proposing a heuristic model to represent the schooling process. This model is obviously going to be influenced by general concerns like those expressed in the present chapter but it must also be informed by a systematic review of the relevant literature. In the next to chapters we turn to the literature review.

CHAPTER 2

THE PSYCHOLOGICAL PERSPECTIVE

Bridges from psychological and sociological concepts to schooling are weak. For this reason a midrange model is difficult to conceptualize. On the sociological side, models explaining variance in educational attainment are numerous, empirically well grounded, and yet, as we have said, how the structural properties of schools actually affect achievement of individual students is unknown. On the psychological side, there is an abundance of evidence that individual-level variables such as sex or race are strongly correlated with achievement, but exactly how the individual's response to significant others, and their responses in turn to him, shape educational attainment remains largely a mystery. There are, to be sure, numerous studies indicating that a teacher's expectations influence her behavior--if she has high expectations for a student she will perhaps press that student to answer a question. But there is no research showing how the interplay between teacher and student may affect achievement over a semester or a grade. We do not know, for example, how the individual's academic self-image is shaped by family or school experience in the early years, or how a pupil's academic self-image mediates school attainment over any realistic time interval such as a semester or a grade.

Nothing much is known about the dynamics of social rewards. Social approval can certainly be a powerful reward in the service of learning, and perhaps is the prepotent one in early days of school. Yet, beyond pointing to this presumption, there is little one can say. Schooling is a group affair and even though social approval must lie at the base of teacher expectations we have little insight into how rewards (or punishments) relate to group dynamics.

If a teacher holds high expectations, the implication is that she expects eventually to approve of the student. In the meantime she will interpret student behavior in light of her expectations and alter her probability of indicating approval. But it is hard to say whether approval is made more or less likely at any given moment. A student for whom the teacher holds high expectations may, for a given quality performance, be less likely to be rewarded (held to higher standards) or more likely to be rewarded (evaluation is more lenient so as to agree with the teacher's prior conceptions). The conditions leading to either outcome cannot be set down from theoretical principles.

As even these simple examples illustrate, relations between expectations, performance, and rewards are complex, and conditioned by the context in which they occur. An added complexity is that other students witness the interaction between the teacher and any single student. These other students may be rewarded or punished by default. If the teacher gives rewards to students for whom she holds low expectations for performance of low quality, but in the past has not given like rewards to other students for performance of similar quality, those other students may be punished even though at that particular moment they are not doing anything. If students perceive teachers' attitudes, and there is evidence that they do, then all students are vicarious participants in any teacher-student interaction. At this stage of our knowledge it is probably impossible to test seriously a micro-model linking teachers' expectations and student performance although Braun (1976) has laid the conceptual groundwork for such a model. However, for a midrange model we need only assume that teacher's expectations add up over time and have some net effect, along with effects of parents and peers. At the same time we will be interested in social structural effects--how race or SES, part of the cultural context, affect the interactions between student and teacher.

Schooling, as we said, involves a mix of psychological and social events. For clarity in discussion, this chapter will concentrate on the psychological, and the next chapter on the sociological. The two cannot be arbitrarily separated, of course, and one major thrust of this chapter is that early schooling coincides with a period in the life cycle termed the "school-child stage" when the child acquires a new role set and a more elaborate self-image. The psychological outcome--self-image--is the consequence of a social process--interaction in school.

The overall self-image is elaborated, after the child begins school, to incorporate an academic self-image. The academic self-image is both an important outcome of the educational process and an important determinant of it. This conceptualization has several advantages, one being that it ties together the individual-level (self-image) and the social-level (role set) variables involved in schooling, and another being that it gives a useful perspective on a large body of empirical research related to schooling.

Most psychological research related to schooling is of two types: (1) the small experimental study to see whether a method of instruction, a curricular change, a particular grouping of pupils, or another thing, is better than some alternative or (2) the shotgun test study to see whether a measure of some psychological characteristic--locus of control, curiosity, self-concept, or the like--is related to school achievement. Much of both kinds of research, unfortunately, is conceptually barren and despite its volume, has done little to elucidate the nature of schooling. Occasionally a clever approach yields a glimmer of insight into the schooling process, as for example when the Pygmalion studies suggested how teachers' "demand characteristics" influence pupil behavior. Even such exceptionally insightful studies fail to firmly pin down the mechanism by which schooling effects are produced, however, so progress is slow at best.

A major conceptual stumbling block for psychological studies of schooling is that formal models of learning, as psychologists present them, place the individual learner in a social vacuum (Estes, 1970). Almost all learning theories emphasize reinforcement or reward, but the nature of rewards, or their effective range with schoolchildren, is generally ignored. For example, formal learning theories do not provide any clues about how a child's race might affect his school learning. Empirical work shows that verbal reinforcement of black children by black adults is generally more effective than verbal reinforcement by white adults. But under some circumstances white adults are more effective, and it is next to impossible to predict exceptions of this kind. In fact, we have only the haziest notions of how human beings interact in face-to-face situations to "produce" learning. We do not have a typology of reward or reward systems. We presume that social approval promotes learning, yet we have no systematic understanding of what social approval is or how it varies.

In this chapter we can hardly point to all the gaps and conceptual deficiencies in the psychological basis of schooling. We will try, however, to clarify how psychological and social influences impinge on the psychological outcomes of schooling, and to say clearly how variables in our model relate to earlier psychological theorizing and research.

Life Stages

The notion of developmental stages underlies many ideas psychologists have about human behavior. This is true especially when behavior is traced through successive periods in the life cycle. Of what do such stages consist? Erikson (1950) and others argue that certain periods of development are understandable in terms of crises defined as individual emotional events. Little evidence bears out this definition of crisis, however, and the linkage of life stages to physical changes is rather arbitrary. We think instead that the socially-defined changes which go hand in hand with life stages (new role obligations and expectancies) are what is more critical. Thus we think "developmental stage" is better understood by emphasizing that the self is re-defined, that at some transition point in the life cycle the person's role set is revised in a major way by some non-familial authority (see Elder, 1968:4). Adolescence, for example, is a turning of the individual toward the peer group with an emphasis on adult-like sex-role obligations. (The alternative is that adolescence is a time when the individual's behavior is governed mainly by a new balance of hormonal bodily functions.) Or "old age" is the stage when retirement from the labor force produces major role changes. (The alternative is to see someone at 65 or 70 as inferior in physical or mental capacity.) A person's social relations rather than attainment of some given chronological age or physical status govern how life-stage transitions are made and defined.

Curiously, one developmental stage in the life cycle, although universal in modern industrial societies, has no name. Partly because it has no name its significance has attracted little attention. It is the school-child stage, and it is marked by the transition from "home-child" to "school-child." When a child begins formal schooling he adds an important new role set: he is now a student with a set of supervisors (teachers, principals, other school personnel), a new set of peers (his fellow students), and a whole new set of role obligations. Upon entering school, the child is certified as being capable of separating himself daily from his family caretakers. He must now attend to his physiological needs himself. He is expected to learn reading and arithmetic. He is expected to allocate his attention so as to enhance his scholastic performance. The period of elementary schooling deserves to be labelled explicitly as a "stage," because it meets the major criterion for defining a distinct life stage: the assumption of a new role set.

As long as his life centered in the home, the child's identity is defined by family membership. He is son, brother, playmate and so on. As soon as he moves from the home to the school, he acquires a new social identity. He is now pupil, classmate, and perhaps for the first time consciously "black" or "white." As Finn (1972:395) notes " in school he first discovers that not all students receive the same reactions from the teacher, the principal or from others. At this age, the reactions to him are not colored by his achievement record so much perhaps, as by his sex, color, physical appearance, or his exhibiting proper--that is, docile--behavior." The child is forced to expand and refine his concept of himself and of the relations between himself and other people. His identity as a social being is enlarged.

The early days of school in fact, provide an ideal "looking glass" for the development of the self as outlined by Cooley, Mead, and others since (Sullivan, 1947). The well-known theorizing about the looking-glass self is largely devoid of empirical data, however. One advantage of recognizing a schoolchild stage is that we point to the looking glass. The set of significant others, in the cultural context provided by a particular school, provides the mirror.

Recognizing an explicit school-child stage also focuses our attention on individual identity formation. A person's identity in any society is in large part determined by his work. People see themselves as "laborers," "executives," "housewives," or "scientists". In fact if one asks an adult who he is, the answer is typically phrased in terms of his occupation. Likewise, children, once they start school, define themselves as pupils. Their "work" is school-work. And even though they usually do not know it, when they begin school they begin almost immediately to be stratified along lines that will separate them into various occupations when they become adults.

If our society is one of contest mobility, it is important to recognize when the contest begins. Studies of high school students show that family background affects eventual placement in the stratification system. But family background, of course, has effects long before secondary school, and to the extent that schools can mitigate background factors at all, it is probably the grade-school years that are critical. Rarely, for example, does a child who fails reading early in school have a bright future. The actual limitations on mobility are becoming increasingly recognized (Havighurst, 1970). We mentioned in the first chapter several reasons why early school achievement may be pivotal, and Kahn (1978:xiv) agrees:

> ...students who do well in high school and go on to college have values and attitudes different from those who do poorly... these differentiating characteristics were with them before they entered high school.... For me the inference is to start earlier both for purposes of explanation and for purposes of change.

Because of its importance in children's ongoing lives and because of what it bodes for the future, then, the "school-child" stage deserves study in its own right. It deserves study particularly for the remainder of the schooling process to be properly understood. Furthermore, identification of a life-cycle stage forces one to pay attention to the interplay between social structure and individual-level variables.

The early days of school must have an enormous impact on how children develop both as individuals and as social beings, and on how they are sorted into social strata, yet our knowledge of this time is fragmentary. We know, for example, that black children who go to integrated schools often question their own self-worth (Rosenberg and Simmons, 1971), but we do not know what their self-worth was when they started. Or that a slight cleavage in dialect between teacher and pupils is often a prelude to underachievement (Rist, 1970), but in other cases, language differances encourage achievement. Or we know that the impact of the school's social structure on the pupil may outweigh the consequences of individual rates of maturation (self-esteem in adolescence is more affected by the kind of school attended (K-8 vs. junior high) than by the physiological timing of pubescence (Blyth, Simmons, and Bush, 1978)) but we have no catalogue of socio-developmental changes, and aside from grade-level norms which some groups of children consistently exceed and others fail to meet, we do not have a calendar of achievement behavior either.

What happens to a child when he goes to school? "Going to school" means the end of complete dependence on the family. First, the school child has some limited mobility--going to school means travelling to and from school with other children, on foot or by bus, and eating at least one meal away from home. Typically seven to eight hours a day are spent away from home. Small wonder that children see schooling as signaling a big change in status. Second, as remarked earlier, the basis of rewards changes. As the child emerges from the protective circle of the family he finds himself rated according to how well he does compared to others of his age, not evaluated as he was before, in terms only of how well he does with respect to his own past record. He used to be accepted by his parents and loved for who he is; at school he is accepted or rejected by teacher and peers according to what he can do.

People in school are attentive to the child's success at completely new activities, especially to things like reading and arithmetic. The child soon discovers that he is rated on his ability to please the teacher, impress his peers, and forecast others' responses to him, as well as on purely "cognitive" performance. He gets feedback from many sources--teachers, principals, classmates--much of it evaluative. He needs to learn to differentiate carefully among other persons, and to learn what is implied by differences in their sex, age, and cultural background.

Once in school, whether he finds the school's activities to his liking or not, the child's rewards depend on his attention to school activities. Success is no longer guaranteed, and he cannot concentrate only on the things he is good at. Even if he cannot tell one note from another he is urged to sing. Even if he is partially color blind he must try to discriminate red from green. The compulsory nature of the grade-school curriculum has profound significance; it means the child is helpless when it comes to guaranteeing himself success. Adults in pursuit of "success" are free to move from one job to another, one spouse to another, one hobby to another. In fact, adults' most frequent response to failure is to move. Elementary school children rarely have that luxury. They are harnessed into a team they must stick with, like it or not.

When formal schooling begins, children soon learn that serious evaluations of them are being made. Some children have preschool experience to help them weather the transition--they know how to sit still for a while, or how to get to school. Others have little or no experience, and they are unfamiliar with the kinds of activities found in the school curriculum. For the first time many children are seriously threatened and fear failure. Only one child in a class can be "best" in reading, so with 30 children in a class, 29 are bound to suffer some loss of reward. The possibility of an unfavorable comparison, furthermore, is outside the child's control because it depends to a considerable extent on who his classmates happen to be. Altogether, the early days of school plunge children into what must be for many a confusing and frightening new environment of social comparison. The net resudue of these comparisons shapes the child's evaluation of himself, what is variously termed the self-concept, self-image, or self-esteem.

We, along with many others, suspect that a child's self-image is a crucial component in his academic development, for his views of himself will filter, color, and even determine his experiences. If he thinks he will do well he will be glad to try. If he thinks he will do poorly, however, he is apt to hang back and avoid doing the very things that will help learning. Low self-regard, furthermore, is infectious. Those who think poorly of themselves encourage others to adopt a pessimistic view of them also. The person who holds himself in low esteem is apt to be held in low esteem by others.

In fact the notion of the "school-child" phase of development ties directly into ideas about the child's developing self-image, because this developmental period is marked by the evalustions he receives for the first time from a new set of significant others. There is a large body of research on children's self-image, some of it related to schooling. Below we will briefly review that literature.

The Self-Image

Concepts related to the self, whether called the self-image, self-concept, self-esteem, or something else, are at the heart of schooling for two main reasons. The first is that a child's self-regard can be seen as one outcome of schooling. The second is that the child's self-regard influences other outcomes, especially achievement; positive attitudes toward the self enhance learning see e.g., Wattenberg and Clifford, 1964; Brookover, Thomas and Patterson, 1964. This distinction between self-concept as outcome and as mediator of schooling is implicit in the literature well before 1960. Clark (1963) and others see one of the child's major tasks as fostering positive self-images in children. Affective outcomes of school, in fact, may be more important than cognitive outcomes in the long run because a child with positive attitudes toward school may remain in school longer, may try to learn on his own outside of school, and may be disposed to continue learning for the rest of his life.

Aside from advocating development of a positive self-image in children on humanitarian or ideological grounds, there are also social grounds for believing in the worth of high self-regard as an educational outcome. Students may not fully employ their talents unless their self-image is positive. Davis (1966), for example, in his well-known frong pond study found that students who attend highly selective colleges (like Princeton) and who receive B's are less likely to apply for graduate school than students who attend less selective colleges and get A's, even though by objective criteria (GRE scores) the Princeton graduates are better qualified. Presumably because stiffer competition has eroded the B student's academic self-image, the Princeton graduate unrealistically clips his aspirations. We know of no explicit parallel study of how evaluation affects the self-image of young children, but similar events must occur and perhaps with more serious long term consequences. Children who through unfavorable social comparison come to underrate their ability early in the game may stop trying in the early grades--the child who thinks he is poor in arithmetic is the classic example. There are many adults, otherwise competent, who can barely add up a check in a restaurant. This is not the place to develop ideas about "number anxiety" but a person who has a few bad experiences in grade-school arithmetic may avoid numbers from that time forward. Underrating of a person's ability is even more disturbing at the elementary school level than at the college level because the elementary curriculum is certainly within the grasp of all normal children. Furthermore, failure to master the elementary curriculum can foreclose paths to high-level achievement in almost every area.

The child's self-image mediates other outcomes, and one part of the academic self-image informs the child's expectations. Children's expectations can be seen as consequences (of teacher evaluations, of parents' expectations), but they can also be seen as mediators between expectations of significant others and the child's performance. We assume that parents and peers, by influencing children's expectations, indirectly influence children's achievement. Parents influence a child's expectations by conveying to the child their own expectations, and the child's expectations then lead the child to do well or poorly. Most psychological research on the self-concept in educational settings has been undertaken in order to understand achievement, for example, the shower of correlational studies of self-esteem is motivated by the conviction that low self-esteem causes low school achievement.

Whether seen as an educational outcome or as a mediator, the self-image* is measured in many different ways. Unfortunately, measures of it are weak in both conceptual and psychometric terms. They suffer as well from being cast in a developmental void--to our knowledge no one traces explicitly how a child develops a self-image using an empirical set of data,** although interactionist notions are generally used to account for the individual's development of a self-image (Kinch, 1960). A few sociologists (see e.g., Parsons, 1955) address themselves to the genesis of notions about the self in early childhood (see Denzin, 1972 for other citations) but their discussions pivot on revisions of the Mead-Cooley theoretical perspective rather than on any set of empirical observations. We therefore can assemble from the literature an intuitively appealing range of propositions purporting to describe how the self evolves but no data to test theoretical statements.

The lack of understanding of exactly how self-image develops is troubling for two reasons. First, most investigators apparently agree that learning is a prime source of individual differences in self-image--obviously the product of experience, the self-image must follow learning experiences that should be identifiable. Second, the self-image is frequently designated as a target for change, but to change the self-image implies knowing something about how it is formed in the first place.

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*From now on the term "self-image" will be used to cover self-concept, self-esteem, and all other similar variables.

**Engel (1959) who demonstrated stability of the self-concept over a 2-year period in adolescence and Morse (1964) who showed a decrease in favorableness of self-perception between grades 3 and 5 are mild exceptions.

To say that minority groups have a lower (or higher) self-image compared to majority groups is just not very useful unless one can trace in terms of "natural history" how these differences evolved, or unless one can modify self-images already developed. A small amount of sociological research addresses the modification issue (see Cohen and Roper, 1972; Entwisle and Webster, 1972, 1973, 1974a, 1974b, 1978), and we will review this research later, but to our knowledge the literature is completely silent on the development issue.

Academic Self-Image

At this point it will be fruitful to review systematically findings in the self-concept area. We have already noted that "self-concept" is variously defined and measured, seen both as a mediator and consequence of educational experiences, and that it supposedly develops in reaction to evaluation by significant others, but we have yet to say exactly what we mean by "academic self-image."

The self-image is one part of a theory that an individual unwittingly constructs for himself, about himself, and it is part of a broader theory which the individual holds with respect to his entire range of significant experiences (see Epstein, 1973). Individuals make and test hypotheses about their "selfs" and revise their concepts accordingly. The purpose of a self-theory is to optimize the individual's pleasure/pain balance; a self-theory facilitates the maintenance of self-esteem and organizes the data of experience to promote effective coping.

The elaboration of a self-image, we believe, is one of the chief developmental task of the "school-child" stage. That is, because the child is definitely separated from his family and undertakes a set of new pursuits once he starts school, he has the opportunity, indeed he cannot avoid, developing a more elaborated view of himself. He is evaluated daily by a whole new set of superiors and peers along a whole new set of dimensions--citizenship, social maturity, athletic prowess, academic competence, perhaps musical and artistic talent, and so on. As he progresses through the early days of school, he experiences a vast new range of opportunities and is evaluated in relative terms according to his reactions and performances.

Rosenberg (1965) comments at length on the importance of the schoolchild years for the shaping of self-esteem, and also emphasizes a point we made earlier: little selectivity is possible in terms of situation--the lower-class child with musical talent cannot move into an upper-class family where such talent would be valued, nor is there any assurance that if the peer group disdains one's talent it would be possible to move to a different school or neighborhood. The social network in which a school child happens to be will act upon his self-esteem in ways that are beyond his control. Adults, as we mentioned, can move about in society in ways to defend their self-esteem--if they are not competent at golf they avoid the game. Children, however, cannot avoid the many activities assigned schoolchildren.

Our interest is limited to one part of the overall self-image, the part relative to academic competence. Some propositions in an individual's self theory consist of his expectations for his own performance in particular academic areas, for example how competent he believes himself to be in reading and arithmetic. We assume, in line with interactionist theories, that the child's estimates of his competence at these academic tasks are based on his assessment of the character of his previous performance at these tasks, usually, if not largely, conveyed by the evaluations he receives from significant others.

In the research to be reported in this book, we operationalized the concept of "academic self-image" by measuring children's expectations for their marks on their next report card in reading and arithmetic. When we asked children to guess what they would get for marks in reading and arithmetic on their next report card, we aimed to find out what the child's expectations were for his own performance. We inferred from the child's reply what his self-image in these distinct areas was.* We are interested in exactly how competent the child becomes in reading and arithmetic, and what leads up to this.

A number of questions immediately come to mind. To what degree is performance shaped by early evaluations the child receives? To what degree is performance shaped by the child's own self-perceptions? Which of these, if either, is prior? Does the child have an initial concept of his own academic ability when he starts school? Is the academic self-image relatively stable over the first three years of school? These are all important questions, especially in trying to sort out the role the self-image may play in mediating school performance. If minority-group children start school with low self-images that interfere with early school performance, this is quite a different state of affairs from minority children receiving low evaluations from first-grade teachers and subsequently lowering their initially high self-images. Frequently in the past, poor achievement of minority-group children has been attributed to their low self-images presumed to reflect the low opinions society as a whole held of their group. That is, since society assigns minority groups low prestige, children of these groups may adopt that view of themselves. Impaired self-images, in turn, cause poor performance (see Rosenberg and Simmons, 1971:1; Poussaint and Atkinson, 1968, 1970). A closely related explanation is that lower-class black children identify with lower-class black adults (use them as role models) and seeing the adults' lack of prestige, then develop low aspirations for their own future achievement that lead to poor school performance (Henderson, 1967).

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*While, by and large, one would think that a specific academic self-image is highly correlated with stated expectations, the correspondence may not be perfect as when a child thinks his teacher is an "easy marker" so she will give him a better mark than he deserves, or conversely, when a child feels he has an "unfair" teacher who marks him down for some reason other than the inferior quality of his performance.

A rather different explanation hinges on low evaluations given such children by teachers either because the quality of the children's performance was low (cognitive deficit) or because the teacher expected and thereby encouraged poor performance (see Massey, Scott, and Dornbusch, 1975).

In the latter case, a child capable of satisfactory achievement is rated low and internalizes the low evaluation, coming to hold it on his own. The main difference between the two ideas about how self-images develop is that the first hinges on a "low evaluation" accorded by society and characteristic of children no matter what their particular school experience, while the second sees day-to-day school experience with particular social others, the teacher and peers, as critical.

Our models address these ideas explicitly because they attend to, and separate out, the influence of social background and teacher evaluation. By studying children from three distinct social backgrounds, we can infer first whether the self-images of children when they start school are well-formed, and if so, how minority-group or low SES children compare with others of middle-class backgrounds. Also as the children progress through the early grades, we can examine the relative contribution of background and of teacher's evaluation to expectations. Furthermore, in tracing self-images in particular areas (expectations for reading and arithmetic) as schooling accumulates, the impact of expectations on attainment can also be assessed.

Previous Research on Self-Image

Most of the literature tying the self-concept to schooling does not directly concern the causal role we see for the self-concept in the schooling process, just presented. Rather this literature consists mainly of correlational studies showing that children's self-concepts vary with the child's position in the social stratification system. Very early it was assumed that self-images of school children match status groupings of society (Wylie, 1963), and that more modest self-estimates of ability occur in girls as compared to boys, blacks as compared to whites, children from low SES homes compared to those from more affluent homes. The low opinions presumably reflected the low esteem in which their group was held by the society at large. But even the earliest studies (Wylie, 1963) suggest that matters may not be so simple--controlling for IQ and SES level, Wylie found no racial differences in children's estimates of their ability for college and her conclusions about the relative self-regard of the two sexes are equivocal.

More recent studies of this type suggest that, if anything, self-concepts of low SES or black elementary school children equal those of high SES or white children (Coleman, 1966; McDaniel, 1967; Scott, 1969; Gibby and Gabler, 1967; Yeatts, 1967; Carpenter and Busse, 1969; Henderson, Goffeney, and Butler, 1969), or even that self-concepts of low SES or black children are higher (Clark and Trowbridge, 1971; Green and Rohwer, 1971; Soares and Soares, 1969a, 1969b, 1970a, 1970b, 1970c; Trowbridge, 1969, 1970a, 1970b, 1972; Zirkel and Moses, 1971; Wilson, 1967; DeBlaissie and Healy, 1970; Hodgkins and Stakenas, 1969; Hunt and Hardt, 1969). But the findings in many cases are not clear-cut and it is puzzling why the majority of the earlier studies (for example, Deutsch, 1960; Keller, 1963; Radke-Yarrow, 1965) found that whites have higher self-concepts than blacks while the reverse is true of the later studies.

The "black pride" movement may have led blacks to regard themselves in a more positive light lately. While possibly true, this conjecture is one that cannot be verified using the highly selective and fragmentary data available. More likely the mixed findings on children's self-esteem reflect the crude nature of the measurement process, the varying operational definitions different investigators have used, and above all the sensitivity of the self-concept to the social context. Rosenberg and Simmon's (1971) large-scale study of Baltimore school children demonstrates the critical nature of the social environment. They show that black children's self-esteem may be lower, the same, or higher than white children's depending on whether the black children take as reference groups children who are better off, as well off, or not as well off as they are, and Beers (1973) draws similar conclusions. The black child from a father-absent home, for example, may not experience a diminution in his self-regard if he attends a school where most of the other children are black and from broken homes. Social contexts can protect self-esteem or erode it. The context, obviously, must be the child's--the world of the elementary schoolchild is not the adult world. Children who belong to low ranking social groups do not necessarily use as a comparison group the society at large. In fact the evidence is that they use their home neighborhood and school as reference groups.

Many of the studies just mentioned sought ultimately to explain the low school attainment of blacks or other minority groups--if minority-group children were found to have low opinions of themselves that fact could serve as an explanation for low achievement--but most of these studies did not directly test the link between self-concept and achievement. Fortunately the link has been verified in studies scattered from the kindergarten level (Wattenberg and Clifford, 1964 and Lamy, 1975), through grade school (Reeder, 1955; Caplin, 1966; Brookover, Thomas and Patterson, 1964; Campbell, 1965; Meyers 1966; Hirsch, Costello and Sears, 1970; Gustafson and Owens, 1971), high school (Brookover, Erickson, and Jones, 1967; Epps, 1969), and college (Stevens, 1956), and also separately for black and/or disadvantaged students (Paschal, 1968; Epps, 1969; Frerichs, 1970).

In fact the major use we make of the extensive literature relating self-concepts to schooling is in this exact respect: self-regard and achievement are consistently associated. Except for establishing this linkage, the psychological literature on self-concept in schooling is weak in every respect. This is a key linkage nevertheless for our cyclic models of the schooling process, for we see educational expectations as both a cause and effect of achievement. The academic self-image and expectations also operationalize the distinction made between affective and cognitive outcomes of schooling. While rarely measured, affective outcomes are important, perhaps more important than strictly cognitive outcomes, as we pointed out earlier.

Expectancy

Expectations embody a concept critical to the schooling process in more ways than we have indicated so far, and two other key concepts, evaluation and reward, are closely related, for expectations are tied to schooling via evaluations and reward. An evaluation is a rating of one person by another, or a rating of the self conditioned by others' reactions. Evaluation thus implies some kind of social matrix. Rewards furthermore are based on evaluation. The teacher may evaluate a child positively and give a reward. Reward or non-reward, in other words, are conditional upon evaluation--the same response can be rewarded one time, or not rewarded the next. For example, a child who reads a paragraph aloud in halting fashion on one day may be positively evaluated by the teacher, but a halting performance the second day may be negatively evaluated. Held to stricter standards of performance the next day, the child is not rewarded for the same quality of performance. Furthermore, any evaluation depends not only on the quality of the child's performance but also on the teacher's expectation. A halting performance by a child for whom the teacher holds high expectations may be differently evaluated than the same quality of performance by a child for whom the teacher holds low expectations. By comparing the child's behavior with her expectations, the teacher carries out the evaluation.

The picture is not that simple, however, for a success in the teacher's eyes need not be a success in the student's eyes. The child compares his behavior with his own expectation. The child mentioned above, even though the teacher was satisfied, may not have been satisfied himself on the first day with his own halting performance. The student's definition of success as well as the teacher's depends on his expectations. A student who gets a B may be rewarded (if he expected a C) or punished (if he expected an A). The child also has expectations about likelihood of reward--these operate to interpret the teacher's reaction. Thus non-response of the teacher can be rewarding, neutral, or punishing depending on the child's expectancy. If he has been rewarded previously, non-response may be punishing (Adelman, 1969).

The interrelationships among expectation, evaluation, and reward can be made clear from a diagram (Figure 2.1). Evaluation implies a comparison of behavior with expectations. The determination of whether there is agreement between behavior and expectations leads to rewards or non-rewards. Both teachers and students react to any one student behavior. If agreement occurs between the quality of the student's behavior and the teacher's expectation, then she will decide "success" and give a reward. Similarly, agreement between the quality of behavior and a student's own expectation will lead to a reward. Both can agree or both can disagree. One case of disagreement is particularly interesting: the teacher rewards (she perceived success) but the student's evaluation is negative because his behavior is less than his expectations.

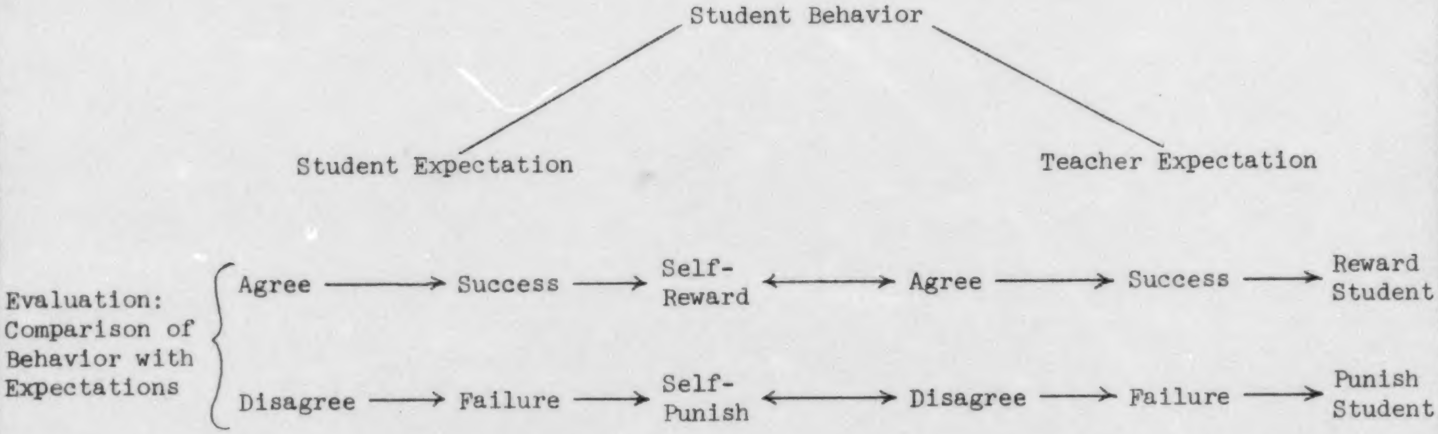
This case exemplifies what has lately been pointed to as "institutional racism" when teachers reward poor pupil performance by blacks because they judge them as incapable of a better performance (see Massey, Scott, and Dornbusch, 1975). These ideas, which are more fully addressed in the sociological literature, will be discussed further in the next chapter.

Evaluation produces rewards (or their opposite) by a process of comparison between behavior and expectations, but expectations are determined partly by a process of social comparison. The teacher's assignment of rewards is complex because expectations for various children are usually not independent. Thus if one child does well, the teacher assumes other children can do well also. Social objects (persons) are being compared to generate her expectations.

Rewards are social in another respect--the teacher has either the authority or the charisma which allow her to bestow rewards. A teacher who is black may be more effective with black children because the social distance separating them is small--she is among the more significant of significant others. Also if she is black, her expectations may be perceived as more legitimate. The likelihood of reward is conditioned as well by the nature of previous dyadic interactions between a teacher and student. If a teacher loses control over her classroom, she may lose the respect of the class and thereby her power to give effective social rewards.

The explicit micro-model linking expectations, evaluations, and rewards (Figure 2.1) is meant to supplement a heuristic model of the schooling process to be presented in Chapter 4. The micro-model shows in detail the nature of the interaction between the child and significant others

Figure 2.1


Student Behavior
Student Expectation
Teacher Expectation
Evaluation: Comparison of Behavior with Expectations
Agree
Success
Self-Reward
Agree
Success
Reward Student
Disagree
Failure
Self-Punish
Disagree
Failure
Punish Student

(mainly the teacher) that occurs in the classroom. The heuristic model postulates only that teacher expectations and evaluations affect children's expectations and performance, not how the process works. The micro-model is useful mainly in seeing how psychological and sociological research links to our schooling model, and is not the direct topic of our own research.

Teacher Expectation

Teacher expectations, mentioned so far many times in passing, had their genesis in Merton's ideas about the self-fulfilling prophecy often mentioned in the social science literature: "Things men see as real are real in their consequences." Teacher expectation research grew directly out of work on experimenter expectancy effects, which was in turn an effort to look at the self-fulfilling prophecy in the laboratory. The literature on teacher expectations is extensive, its content is fairly well-known, and by now it has been thoroughly reviewed on several occasions (Baker and Crist, 1971; Brophy and Good, 1974; Finn, 1972; Rosenthal, 1972; West and Anderson, 1974; Braun, 1976). Although expectancy effects are by no means uniformly found (for exceptions see e.g. Jose and Cody, 1971; Mendels and Flanders, 1973; Fleming and Anttonen, 1970; Goldsmith, 1970; Claiborn, 1969), the phenomenon of teacher expectancy has sufficient psychological credibility so that failures to find it are not necessarily interpreted as proof of its non-existence. Also there is, of course, reason to think that teachers' expectations may play a major role in fostering some kinds of achievement but only a small role in others.

The research on teacher expectations, which now encompasses well over 100 articles, can be classified along two main lines--experimental studies in which teachers' expectations are manipulated and then the consequences observed, or studies in natural settings where teachers' expectations are assessed and then their classroom behavior is observed to see if, and how their expectations are expressed in their behavior. The early Pygmalion-in-the-classroom work (Rosenthal and Jacobson, 1968) is an example of the former: children identified to the teacher as "late bloomers" were reported to gain more on IQ tests over the first grade year than other children who were not labelled as "late bloomers." Many examples of the latter are contained in Brophy and Good's work--they find that students for whom teachers hold high expectations are held to stricter standards, called upon more, and more often pressed for answers (Brophy and Good, 1974). In a nutshell, the early teacher expectation studies established the credibility of the Pygmalion pheonomenon, while the more recent studies inquired into how such an effect could be mediated.

In the literature on teachers' expectations, children's expectations have for the most part been ignored. Some sociological research, to be discussed in the next chapter, looks at the links between teacher expectations and children's expectations (Entwisle and Webster, 1972, 1973, 1974a, 1974b; Cohen and Roper, 1972), also at the status of both since expectations are closely tied to status, but psychological studies often overlook these interdependences.

Teacher expectations research interests us, of course, because like research on the self-image, it validates some of the causal connections we will make between variables in our models. It also suggests what the nature of some of the structural relations may be, that is, whether teacher-student influence should be reciprocal or unidirectional, and what the causal order may be. Mostly this research pertains to the link between teachers' expectations and pupil achievement.

In our micro-model we assumed that teachers' expectations exist, that they relate to children's behavior, and that students may know them. Some of the empirical work addresses these assumptions, for naturalistic studies of teacher expectations examine how teachers' expectations arise under natural conditions, and what teacher behaviors affect pupil achievement and what teacher behaviors convey teacher expectations to pupils. These studies, in other words, either clarify the genesis and expression of teacher expectations or document the linkage from teachers' expectations to pupil behavior.

In our heuristic model we will assume that a child's expectations for himself affect a teacher's expectation and that this is one major way children's self-image affects the evaluations (marks) teachers give. With the few exceptions noted below, children's expectations have not been investigated along with teacher expectations, however, and only lately are teacher expectations being linked either to teacher or pupil characteristics. The large body of research on teacher expectations therefore has much more to say about the micro model than the heuristic model, and is therefore not as relevant as might be thought.

On the other hand, other kinds of teacher expectation research could have great relevance because, as one might guess, there are hints that very young students are particularly susceptible to expectation effects (see Mendels and Flanders, 1973; Rosenthal and Jacobson, 1968; Kerman, 1974; Brophy and Good, 1974; Seaver, 1973). Children starting school have no basis on which to judge teachers, so that teachers' expectations may be more potent at that time than later. In fact, this may be one reason for difference in findings from one study to another. So far, unfortunately, age in relation to teacher expectations has been studied only incidentally.

Findings from naturalistic studies of teacher expectations do validate certain links in our model, and of course naturalistic studies enlarge our understanding of our schooling process.

Teachers' Expression of Expectations

There is some consensus that teachers give fewer response opportunities to students for whom they hold low expectations (Cornbleth, 1972; Good, 1970; Kranz, Weber, and Fishell, 1970; Mendoza, 1971; Cornbleth, David, and Button, 1974; Perry, 1975) pay less attention to them (Rise, 1970; Rothbart, Dalfen and Barrett, 1971), and are more likely to accept a poor performance from them (Brophy and Good, 1970). If teachers interact more with students for whom they hold high expectations, as these studies suggest, it is not surprising that such students talk more (Rothbart, Dalfen, and Barrett, 1971), that such students are more often called upon to answer questions (Perry, 1975) or that they are more often provided with probing feedback (Perry, 1975).

A question not explicitly raised in most teacher expectation studies is whether, even if teachers express expectations by certain behaviors visible to researchers, students are aware of the teacher's behavior. That is, does the student who is the target of high expectations "read" the teacher? Fortunately, there are a couple of studies on a closely related topic, student awareness of "teachers' attitudes" (Davidson and

Lang, 1960; Silberman, 1969). Silberman found that students who received behavioral expressions of teachers' attitudes were aware of them, and that such behaviors aimed at particular students were visible to other students in the class as well. For example, teachers avoided displaying favoritism by avoiding interaction with students to whom they felt a sense of attachment, but they openly displayed their concern for these students; they seemed unmindful of students to whom they were indifferent, and their interactions with them were perfunctory and infrequent. By direct questioning Silberman found that students could correctly identify classmates to whom their teachers were indifferent.

How praise and reward are related to teachers' expectations is not at all clear and generally, no differences according to expectations in teachers' patterns of praise appear. Probably as Silberman suggests, teachers consciously try not to play favorites. Also most teachers today perceive children's need for positive reinforcement. They know children who are never praised are apt to cease trying. There are exceptions (Kranz et al., 1970; Brophy and Good, 1970), however, seen particularly in Rubovits and Maehr's studies (1970, 1973) of "gifted" students. They found that gifted students generally received more praise, but that white gifted students received extra praise denied black gifted students. Also the quality of teacher-pupil interaction can reflect subtle aspects of praise and reward, even when the amount of praise is constant. Kranz et al. (1970) found that low expectation students are the targets of more "managerial" teacher behavior.

A distinguishing characteristic of how teachers' expectations affect their behavior may lie in the extent to which pupil effort is recognized.

This topic has so far received little attention. How effort is evaluated and rewarded may actually be the critical distinction between how teachers treat high and low expectation students, given performance of equal quality. Children who "try"--who pay attention, who persist at schoolwork, who make another attempt when their first is unsuccessful--may be rewarded if they are high expectation students, or not rewarded if they are low. For instance, consider the teachers' questioning of high expectation students to encourage the student to offer another answer if the first answer is wrong and contrast it with their not looking for a second answer from low expectation students. The first recognizes effort, the second discourages it. Also at times teachers insist that high expectation students produce a high quality response--they hold them to higher standards, and so offer rewards for more effort, but do not offer similar contingent rewards to lows. Low expectation students may even be discouraged from making effort, because less able students emit behaviors that are off the mark and therefore are hard for teachers to react to. Since lows initiate behavior that requires the teacher to digress from the normal course of instruction the teacher may try to suppress the behavior in order to keep tight control over the instruction process. There is evidence that more time is spent in non-teaching activities with low expectation students (Beez, 1968). Clearly, reward, praise, evaluation, and teachers' expectations are not analystically clarified by this research.

Origins of Expectations

Some of the most imaginative studies in naturalistic settings are those seeking to explain how teachers' expectations arise. Seaver (1973) found that teachers held high expectations for first-graders whose siblings had done well earlier, and teachers held low expectations for first-graders whose siblings had done poorly. Furthermore, the achievement scores of the high-expectation first-graders exceeded those of low-expectation first-graders. Other student characteristics that shape teachers' expectations are names or dialect. Harari (1973) found that children with unusual names are labelled as losers. A number of studies (e.g., Rist, 1970; Williams, 1970) show that children's speech is influential on teachers' expectations.

One reason the extensive literature on teachers' expectations is weak from our point of view is because status characteristics (one focus of the theory of expectation states to be discussed in Chapter 3) have not been included in teacher expectations studies until recently. It is now fairly clear that pupils being white, of high IQ, or of relatively high SES is likely to lead teachers to form high expectations (Cooper and Lowe, 1977; Cooper, Baron, and Lowe, 1975). The general lack of attention to "race" effects on teachers' expectations is surprising in view of well-known "experimenter effects" attributable to race in experimentation, testing, interviewing, and psychotherapy (see Sattler, 1970), the kind of research that initially triggered teacher expectation studies. Also an entirely different line of work, research on the school achievement of disadvantaged or minority-group children, emphasizes the cultural differences in how status characteristics affect classroom interactions. Middle-class children for example, are more receptive to verbal rewards or smiles from adults than lower-class children, and middle-class children have a different kind of sociolinguistic competence from lower-class children. These facts, although of themselves topics of a great deal of research in the last decade, did not diffuse into work on teachers' expectations. In our research we will examine the impact of a pupil's race and sex on teachers' evaluations, and also try to estimate how much of a teacher's marks reflects achievement as measured by objective tests and how much reflects subjective factors--the teacher's subjective judgments including her expectations. These are topics to which teacher expectations work pays little attention.

Expectations and Achievement

Many (Good, 1970; Becher, 1978; Beez, 1968; Brophy and Good, 1970, 1974) have shown that teachers' expectations affect elementary pupil achievement, and although the finding does not always replicate, few doubt that under appropriate conditions pupils tend to alter behavior so as to conform to teachers' expectations. The exact process by which teacher expectations are converted into achievement is less often investigated, although Good (1970) shows that for four classes of first-graders, high-expectation students consistently received more opportunities to respond, and that opportunities to respond and reading achievement correlated 0.71 on the average.

The relations between teacher expectations, evaluation and reward, however, are not clear. No doubt both achievement and affective development are fostered by a "proper" mix of reward and non-reward. That is, 100% success is not necessarily optimal for learning. Nor is a teacher's reward necessarily a reward in the eyes of the student. In fact, as the teacher expectation literature becomes more extensive, and particularly as it tries to deal with status characteristics of teachers and children, the need is clear for a more general theory--a theory of schooling. Thus rather than mine this research lode much further, we will turn to formulations that seem more fruitful. There seem to be several possibilities, all of which can be handled in terms of the model we will propose.

One way teacher expectations could be converted into pupil performance is directly. Teachers might evaluate pupils in accord with their (teachers') expectations, so that a child would receive a high mark if the teacher thought the child was capable of high-level performance no matter what the nature of the actual performance. If the child actually performing at a B level in reading were given an A, one consequence might be that the child would improve his performance to a level justifying the mark. In the early days of school this might be fairly easy for a child to do. Another possibility is that since evaluation standards are rather hazy, both teacher and pupil might perceive the pupil's performance of "A" calibre even though by other people's standards it was worth only a B. A third possibility* is that the teacher might award an A, not on reading performance, but on other grounds such as SES or race. Performance is not unidimensional and often in the early grades status interacts with quality of performance--

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*Still another possibility is that the teachers' expectations actually distort her interpretation of students' behavior. Thus when the high expectation student gives a wrong answer, she may "hear" a right answer. Such effects would be consistent with what is known about this, although not yet investigated in teacher expectancy work.

white children who speak network English may be judged better in reading than black children who speak a dialect even though the reading capability of the latter is better. There are thus several ways for teachers' expectations to be directly represented in attainment as measured by teachers' marks.

The teacher in all of the three instances just outlined would think she was rewarding the child because she was providing a positive evaluation, but from the child's vantage point the picture might look different. The child performing at a B level but awarded an A might interpret the A as a reward for effort, especially if he was expending some. The child awarded an A because evaluation standards are hazy might be in a state of confusion because the standards for evaluation are not clear. Thus he might not be able to assess the quality of his behavior and so be unable to judge whether either his expectations or his performance are defined correctly. The third possibility--that the teacher's evaluation depends on the child's status characteristics--definitely breaks down the association between performance and evaluations. To the extent that clear feedback facilitates learning--and there is little doubt of it--all of these direct effects of teacher expectations may undercut learning because the reward depends on something other than the objectively measured quality of the student's performance.

Teachers' expectations could also be converted into pupil performance indirectly, via pupils' expectations or parents' expectations. To our knowledge, none of the teacher expectation literature explicitly mentions the possible influence of teacher expectations on parents' expectations or looks for evidence of it, although in an earlier report (Entwisle and

Hayduk, 1978) we show that parents' expectations for second graders are responsive to teachers' evaluations rendered in first grade. And, as earlier noted, children's expectations have only recently been introduced in the teacher expectation literature, although earlier Davidson and Lang (1960) showed a significant positive correlation between teacher's views of pupils and the pupils' views of themselves. In a series of field experiments Entwisle and Webster (1972, 1973, 1974a, 1974b) showed that children's expectations respond to "teacher's" evaluations and lead to behavioral consequences (increased hand raising) with obvious links to classroom learning.

Teacher's expectations may exert their biggest impact by shaping pupil expectations. If a teacher conveys to a student that she holds a high opinion of him, that student may then hold a better opinion of himself. Holding a better self-image may cause the student to be more self-confident, to be more willing to respond, and so on. Verification of the critical nature of children's expectations and the interaction between children's expectations and teacher expectations is found in an experimental study by Rappaport and Rappaport (1975) with five-and six-year-old black inner city children. When these investigations increased children's expectations, or both teachers' expectations and children's expectations, they produced significant increments in the children's reading achievement test scores. (They were apparently uninformed about the Entwisle and Webster experiments although their experimental design is very similar.) The Rappaport and Rappaport experiments are the closest link in the psychological expectancy literature to sociological work in expectation states theory. Several sociologists have conjectured that a realistic route to improving school performance may lie in changing children's expectations. This will be discussed more fully in the next chapter.

Still a third way for teachers' expectations to influence performance is through responses to classmates. If a teacher holds high expectations for one student or subgroup of students, say for the white children in a class, by conveying her high expectations to this select group she may convey low expectations to the rest by default. Rist's observations of a kindergarten class in which the teacher interacted mainly with high status children is such a case--the teacher provided the favored few with more actual learning experiences but in addition by attending to these students more than the others, she signalled her low expectations for the lower-status children.

In our formal models we have no explicit variable labelled "teacher expectations." Rather we assume that teacher evaluations (marks) are one consequence of teacher expectations.*

Several heuristic models proposed by psychologists recently (see especially Finn (1972) and Braun (1976)) aim to account for the effect of teachers' expectations on pupils' expectations and achievement. (In Chapter 4 we will draw upon these models in formulating a heuristic model of our own.) These models draw heavily upon many of the ideas discussed in this chapter--that teachers' expectations influence achievement, that race or socioeconomic status may affect expectations, that the child's expectations ("self-image") correlates with achievement, and so on. Although the models include "social elements"--race, parents' expectations, peer expectations,--they acknowledge merely that social structure must influence the process of schooling. They do not suggest how a testable model including social structure might be formulated. Another major element missing from these models is evaluation, either by the teacher or by the student himself. Thus what drives the process is left unspecified. Also the child's self-image is not mentioned as an explicit outcome of schooling, for, as is the case with most research on schooling in the sociological domain, cognitive outcomes are the focus of attention.

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*Later we will show that when teachers are asked to forecast the marks children will receive "next year" their forecasts correlate very strongly with marks they have assigned (above .60 in every instance). We avoided asking teachers about their expectations during the school year because of possible dangers of reactivity. That is, if teachers were repeatedly questioned about their "expectations" we were afraid this questioning would bias the data by causing teachers to depart from their normal behaviors in the classroom.

The research reviewed in this chapter suggests a number of things, among them, that a "school child" stage of development is characterized by the child's acquisition of a new set of roles and that this new social structure in which the child finds himself may be one key to understanding the process of schooling. Also that elements of those new social relations the child is involved in, particularly the structure of teachers' expectations, are critical to achievement. Some of the research points to links between children's expectations and teacher expectations and some to the behavioral expression and interpretation of expectations. Generally, the research is weak from our standpoint because two or three variables are the limit in any design, and feedback or circular effects, while acknowledged likely, are not directly investigated. In addition, despite the importance of marks and report cards in schools, almost no attention is given to marking practices, or how evaluation in the form of report cards relates to schooling.

CHAPTER 3

THE SOCIOLOGICAL PERSPECTIVE

Our review in Chapter 2 of psychological research bearing on schooling turned up little work on the cultural context of schooling or formal evaluation. Despite the large and growing number of studies on teacher expectations, we are ignorant of how expectations influence evaluation, even though the major impact of different expectations is that different standards for evaluation are being applied. How do expectations and evaluations relate to one another? Fortunately some of the sociological literature speaks to this issue in terms of both theory and empirical findings. Also from Chapter 2 it became clear that status characteristics and/or cultural context--race of student, race of teacher, location of school, and so on--are likely important components of expectation formation and expression, but systematic research on such topics is sparse. A few studies include race as a variable but neither the studies relating race to students' expectations for the self nor studies relating race to teacher expectations can be arrayed in any orderly fashion.

Fortunately several sociologists have taken interest in the links between expectations and evaluation and in how the status characteristics of actors affect social interaction. Some laboratory experiments and field studies closely tied to expectation states theory (Berger, Conner, and Fisek, 1974*) are part of this background. This body of research extends findings from psychological research along the two critical dimensions of status and evaluation.

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* See also Berger, Fisek, and Zelditch, 1977

A second tradition in sociology offers less direct guidance but forms an even more important back drop for our work: the research on adolescent status attainment. The volume of work in this tradition is so large that in no sense can we provide an exhaustive review. Our intent is rather to highlight both the similarities and differences between our work and research in that tradition. The reader should be especially careful not to jump to the conclusion that our research is another example of that kind of research. Rather our modeling bears some superficial resemblances to models found useful in understanding status attainment, but our purpose and strategy differ. In Chapter 5 when we describe the variables we actually measured and our study design several important distinctions will be made clear that separate our work from all previous sociological studies of status attainment. First, we are attempting to describe the schooling process. Second, both affective and cognitive outcomes are considered, but processes rather than outcomes are the major focus. Third, the pattern of assumptions about significant others' influence is reminiscent of what is seen in most models for secondary students, but both the conceptual nature and the method of measurement differs. Students' expectations in secondary school studies, for example, generally mean "expectations for more education." For us expectations mean a specific forecast for quality of performance--a child is asked to "guess" what mark in reading he will receive on his next report card. Similarly parents' and peers' expectations are targeted on specific areas of evaluation (reading, arithmetic, and conduct) rather than expectations for further education. Finally data were collected over a long time interval with many variables measured repeatedly at times to correspond with our assumptions about causal processes and pertain exclusively to children in the first three grades.

This is not the place to dwell further on these distinctions but later in this chapter in a brief review of status attainment research and in the next two chapters when we describe a heuristic model, the reader should attend carefully to the differences between our approach and other previous sociological work. To oversimplify, we have started from a static psychological model and then stretched it out over time, so that it becomes a dynamic paradigm. But we have drawn heavily upon the sociological work, using analytic techniques and modelling strategies suggested by sociologists. Furthermore, empirical sociological research, particularly that linking concepts of evaluation, expectation, and status, provided many ideas about how to ground our models empirically.

Expectation States

Theory

Most versions of expectation states theory (see e.g., Berger et al., 1974, 1977) include a statement of so-called "basic expectation assumption:" the structure of expectations held by members of a group will determine the power and prestige structure of the group. The theory also includes the concept of a source: an actor whose evaluations are accepted and used by others in the group as the basis of the expectations they hold for their own and each other's performance. Considerable laboratory research testifies to the validity of the basic assumption. In most of this research the effect of expectation states has been assessed using a single consequence: rejection of influence under conditions of disagreement. Simply put, if a person holds high expectations for the quality of his own judgment he will be more likely to resist attempts to get him to change his mind to conform with some other person's opinion. In laboratory experiments, high expectations are induced by giving people high assessments of their mythical ability at some artificial task, or are assumed (high expectations follow the common status dimensions, white higher than black, college students higher than high school students, and so on.)

This prior laboratory work is of limited interest because it does not examine effects of expectations on achievement, and in fact is carried out in settings so far removed from ordinary schools as to cast doubt upon its ecological validity. But fortunately, this approach prompted three major lines of experimental work with school children and other related work in formal organizations. This work is reviewed in the next section.

Sociological Experiments

One series of sociological field experiments by Entwisle and Webster (1972, 1973, 1974a, 1974b, 1978; Webster and Entwisle, 1976) extended the scope of the laboratory experiments in expectation states theory to elementary school age children. The question was whether children's expectations for their own performance respond to evaluations given by teacher-like adults. Another series, by Cohen and her associates (Cohen, 1968; Cohen, Lohmann, Hall, Lucero, and Roper, 1970; Cohen and

Roper, 1971, 1972), tried to discover how expectations held by children can be modified. Both sets of experiments form a bridge from the psychological to the sociological, for they both concern how children's expectations are affected by status characteristics (race). They also explicitly incorporate evaluation as the major experimental maneuver and thus directly address that important issue neglected by most psychological studies: how expectations and evaluations relate to one another. For schooling, with its repeated evaluations and grading, this link naturally commands attention.

Entwisle and Webster inquired first whether adults, by providing positive evaluations, could actually raise children's expectations. Using a story-telling task and matching subjects in ways to control for other possible causes, they first demonstrated that positive evaluations lead children to raise their expectations for their own performance at school-like tasks. (Dornbusch (1972) and Scott (1975) note a lack of correspondence between negative evaluations and competence.) In subsequent work with the same experimental paradigm, they found that social distance is inversely correlated with the effectiveness of an evaluator--black lower-class children do not raise expectations much as a consequence of positive evaluations by white middle-class adults (1974b). Other status characteristics--rural-urbanness--also turned out to affect an evaluator's effectiveness. To tie such work to the classroom even more directly, Entwisle and Webster went on to demonstrate that evaluations of school peers follow the same general rules as evaluations of teacher surrogates (Webster and Entwisle, 1976) and that expectations spill over from one area to another (1978). Children whose expectations are raised for one task also register a gain in expectations for other unrelated tasks, although as would be expected, there is a generalization gradient.

This series of experiments is useful as a basis for proposing a model of the schooling process mainly because children's expectations, a topic receiving relatively little attention elsewhere, are demonstrated to be a central concept. They are also useful because they suggest how status may affect receptivity to evaluations--it is possible that a white child will not even process the evaluation of a black teacher, or the opposite.

In the late 60's Cohen and her associates (see Cohen and Roper, 1972), started a different series of experiments from the same theoretical base. They showed that peers' expectations can overwhelm some kinds of evaluation evidence, in particular that evaluations may respond much more strongly to status characteristics than to evidence of competence.* In one kind of experiment they gave black junior high children special training on how to assemble crystal sets before groups of both black and white children were formed. The mixed-race groups then undertook jointly the assembly of another crystal set, a task already better understood by the blacks. The white children acted in accordance with their low expectations for blacks, presumably the consequence of prior interracial contact, and gave blacks fewer action opportunities, paid little attention to their suggestions, and so on. This "racial interaction disability" proved so severe that no amount of time on the experimental task was sufficient to counteract it (see Cohen et al., 1970). Only by showing blacks skillfully assembling crystal sets and having experimenters comment positively upon this in front of white children could the initial negative expectations that whites held for blacks be overcome.

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*White members of problem-solving groups initially tended to be more active than black members and also more influential in decision-making (Cohen, 1968).

This series of experiments points again to children's expectations as a critical variable. They also point up that racially-based expectations may be very resistant to change and how sensitive evaluations may be to non-performance based criteria.

Together with the work of Scott and Dornbusch, to be discussed shortly, these experiments affected our theorizing in several respects. They underscored the importance of children's expectations per se. In the vast literature on teachers' expectations the mechanism whereby teacher expectations affect achievement is usually left unclear, and as we indicated in the last chapter, one appealing mechanism links teacher expectations to pupil expectations. The experiments also led to the demise of the particular line of research they exemplified for the range of initial expectation levels of children observed by Entwisle and Webster at the start of their experiments and the refractoriness of expectations observed by Cohen and her co-workers, both suggested that naturalistic study of children's expectations was a more tempting line of inquiry then experimental study. What is it in children's everyday experience that causes them to develop high or low expectations for themselves? Do natural events involving evaluation (receiving marks from teachers) cause expectations to change? What is it about a child's social milieu that may lead blacks or other minorities to develop low expectations for themselves? In short, a child's expectations are one consequence of schooling, an important affective outcome, as we have already asserted. By measuring a child's expectations we could have a means of assessing non-cognitive outcomes. Also through observations, overtime, we might be able to determine how the non-cognitive (expectations) affects the cognitive (achievement).

Research in Organizational Settings

The experiments assumed the importance of evaluation. Other research by Dornbusch and Scott (1975) documents that assumption. In a study of formal organizations ranging from hospitals to an electronics firm to a football team, they focus on the relation of a person's position in an organizational hierarchy to the structure of authority. They are very much concerned with evaluations. Other concerns of theirs, such as "authority rights" (how performance criteria are set and how appraisals are made) or "goals, tasks, and sanctions," are less problematic in the elementary classroom and so less problematic for our work than for theirs. Pupils usually acknowledge the authority rights of teachers, for example, and school goals are also relatively well-formed compared to goals in other kinds of organizations. Their analysis of evaluation, however, fills a void noted earlier in the schooling literature for the studies of teacher expectations make clear neither the evaluation given by the teacher nor the explicit relation among expectations, evaluations, and rewards. True, some research shows that teachers' evaluations are influenced by their expectations (they demand more from high expectation students) or that pupils' expectations are influenced by evaluations (low achievers sometimes have a low self-image), but the dynamic interplay among these three variables is left hanging. Rewards per se are never the center of discussion.

Dornbusch and Scott found that the clearness of evaluation criteria in the eyes of the person being evaluated is keyed to a person's satisfaction with his organization. Also that non-performance criteria are often used in formulating evaluations. Most interesting for us perhaps are their ideas about "incompatibility"--this occurs when an evaluation is below the acceptance level of the person being evaluated. (We implied a comparison of this kind in the micro-model presented in Chapter 2 when we allowed for a comparison between student evaluation and teacher evaluation.) Incompatibility, furthermore, leads to instability, or personal dissatisfaction with the organization. If a teacher rewards a student for behavior that the student himself denigrates, the whole system is undercut. Such dissatisfaction may be registered by way of acts of non-compliance (rebellion, disorder) as well as in terms of attitude (alienation, disaffection).

Particularly in their insightful analysis of the properties of evaluations, Dornbusch and Scott point to several things ordinarily neglected in schooling research that must have enormous influence on how young children react to their marks early in school. They speak of an "incompatible authority system"--our translation is "lack of useful feedback from teacher to pupil."--and the several incompatibilities all ring true as sources of breakdown in classroom learning.

The first incompatibility is receipt of contradictory evaluations--children rewarded and punished for the same behavior. Although this could mean "contradictory to the same person only," there is no reason not to extend it to the overall classroom scene where often some children are rewarded for behavior that is punished in others. This point was made in Chapter 2 in talking about the leakage in the reward system occurring when all students witness the rewards or punishment given any one student and make comparisons with how they themselves have been treated.

The second incompatibility is uncontrollable evaluation. To the extent that socioeconomic status, as noted by Rist, or sex, as noted by several researchers in investigations of reading, influence evaluation, the pupil cannot change his SES or sex and so does not have control over the evaluations made of him. There are other dimensions of control also, pointed out in Chapter 1: the compulsory and non-elective nature of the elementary school curriculum. Pupils cannot decide on which tasks or goals to set, and therefore cannot control evaluation by matching their talents to the tasks.

The third incompatibility is unpredictable evaluations--the pupil does not know the marking standards or what behaviors are being judged. A particularly worrisome aspect of unpredictability, alluded to in Chapter 2, is that the standards are constantly moving. A satisfactory reading performance today is not quite good enough tomorrow. Also standards are multiple. Students' oral reading proficiency depends on accuracy of decoding, on speed of decoding, on "expression" in tone of voice, and so on. At one moment a teacher may evaluate on expression, at another moment switch to decoding speed. Also evaluations are unpredictable to the extent they reflect classroom atmosphere. A teacher may vent her anger on one child whose conduct is only mildly disturbing after she has just tried to deal less severely with similar conduct of other children. Or a passable reading performance may be downgraded if it follows an exceptionally good one. There is no doubt that school evaluations can be perplexing--children sense evaluations are important but often they do not know their basis.

The last incompatibility is unattainable evaluations, and for school children this kind of incompatibility is closely related to the unpredictable, mentioned above. Some children may be unable to attain an A in reading in first grade mainly because the teacher's norms for marking do not include any A's. There are other reasons as well for unattainable evaluations, the child being absent, having visual or hearing disorders as yet uncorrected, or being physiologically immature for his age.

All of these kinds of incompatibilities lead to pressure for change: instability. For school children such pressures have no natural outlets. As we remarked earlier, children cannot change families nor can they often change classrooms. They are powerless to alter the curriculum and have only the weakest influence on evaluation systems. The upshot is that changing the system is for the most an impossibility. Instead the children must change. If evaluation standards are murky, contradictory, uncontrollable, or unattainable, one option is for the pupil to ignore them, to put himself out of their reach. He can do this by failing to attend school or by absenting himself psychologically even when he is physically present. Another option is to say the tasks and the goals of the school are unimportant and so the evaluations are irrelevant. In either case the feedback required for learning--evaluation--is not processed. This lowers achievement. At the same time it is also likely that the child's self-image is either eroded or changed by such pressure-relieving options.

Dornbusch and Scott do not present any empirical evidence related to young school children but their conceptualization of authority and its relation to evaluation helps fill a serious gap in the literature reviewed in Chapter 2. Expectations are expressed behaviorally as part of the evaluation process. Evaluation (reward or its lack) is seen as critical to learning, either in terms of reinforcement (affect) or information. In sociological models of schooling, achievement is taken as an outcome of schooling but except in mid-range studies, like those listed in Chapter 1, the teacher's role in employing evaluation to stimulate achievement is overlooked. Pupil and home variables that influence achievement are assessed but teacher variables are not. Until lately that assumption was in line with a large body of evidence in the education literature pointing to contradictory or null findings relating to "teacher effectiveness." But recent work by economists (Murnane, 1975; Hanushek, 1972) and others (Berkeley, 1978; Pederson, Faucher, and Eaton, 1978) calls this assumption into serious question, and even suggests that macro-sociological studies of schooling may have failed to find school effects because the school rather than the classroom was the unit of analysis. The curious absence of studies on grading practices also leaves us in a position of having very little information on evaluations, a teacher specific variable.

Other work in a later study (Massey, Scott, and Dornbusch, 1975) presents findings from an urban school district pointing to a distorted evaluation system as one explanation for the poor school performance of minority students. Black high school students surveyed in San Francisco in 1974 did not consider evaluations soundly based. About half the students believed they would not get poor marks if they did poor work or did not try, and low achievers perceived teachers giving more praise than high achievers. Massey, Scott and Dornbusch see faulty evaluation as a major cause of the poor performance of black students. Whether true or not, their work points to the need for research *jointly* in expectations, evaluations, and social structure. Looking at these variables in isolation may be misleading.

The interplay between performance of a young student and the evaluations he receives from significant others has been elusive, whether in the minds of practitioners or in the theories of researchers. Parents wonder how to express their hopes for their children in ways to make these come true--they are sometimes fearful that by expecting too much they may hobble the child. Teachers suffer from the same kinds of misgivings. A strategy of classroom evaluations is especially hard to come up with, because the rewarding of one child often leads to the implicit punishment of others--a child who witnesses positive evaluations of a classmate may conclude that his own performance, if it is not similarly praised, is not praiseworthy. Also, the teacher has the delicate problem of trying to balance the capabilities and talents of each child against that child's performance.

Only recently have researchers tackled evaluation in any formal way. As mentioned, Dornbusch and Scott have looked carefully at evaluations in formal organizational settings, but surprisingly, the structure of evaluation has not been determinately linked to students' achievement in elementary schools. As Bossert (1978) points out, theories of school learning traditionally treat the school at two extremes; either as a "black box", or as a highly individualized and fragmented system of social exchanges. Thus, elementary schools commonly have marking policies based either on effort, on grade-level achievement norms, or both but researchers have not systematically addressed questions that would separate out effects of these two evaluation policies. Indeed there are not even data which show how consistently teachers implement a marking policy, or if they can.

Considerable evidence, however, makes one think that patterns of evaluation are critical in establishing early achievement. First, evaluation provides feedback to guide performance. All kinds of studies attest to the role of information in shaping performance. Without knowing how he is doing, the child has no way to increase his competence. Second, the young child cannot very well evaluate himself and so must depend on others for information. To be sure he can compare his reading ability with that of his neighbor or his sister, but there is no way for him to know how they compare with the rest of the world, or whether his relation to them is valid--if his neighbor is dyslexic or he may attribute to himself a higher level of competence than is warranted. Or if significant others are in disagreement, what happens? The potential problems in evaluation so far mentioned, at the micro-level, focus attention on the individual nested in his small set of significant others. What about the more global elements of the social system, say the evaluation policies of teacher or school? Or the implicit social evaluations that are implied by minority group or sex-category membership? There are hints here and there of sex bias in teachers' interactions with young children. In Chapter 6 some evidence will be presented that the child's sex directly affects his performance and his academic self-image. In any case investigation of such factors is long overdue.

Modeling: Macro-Research in Sociology

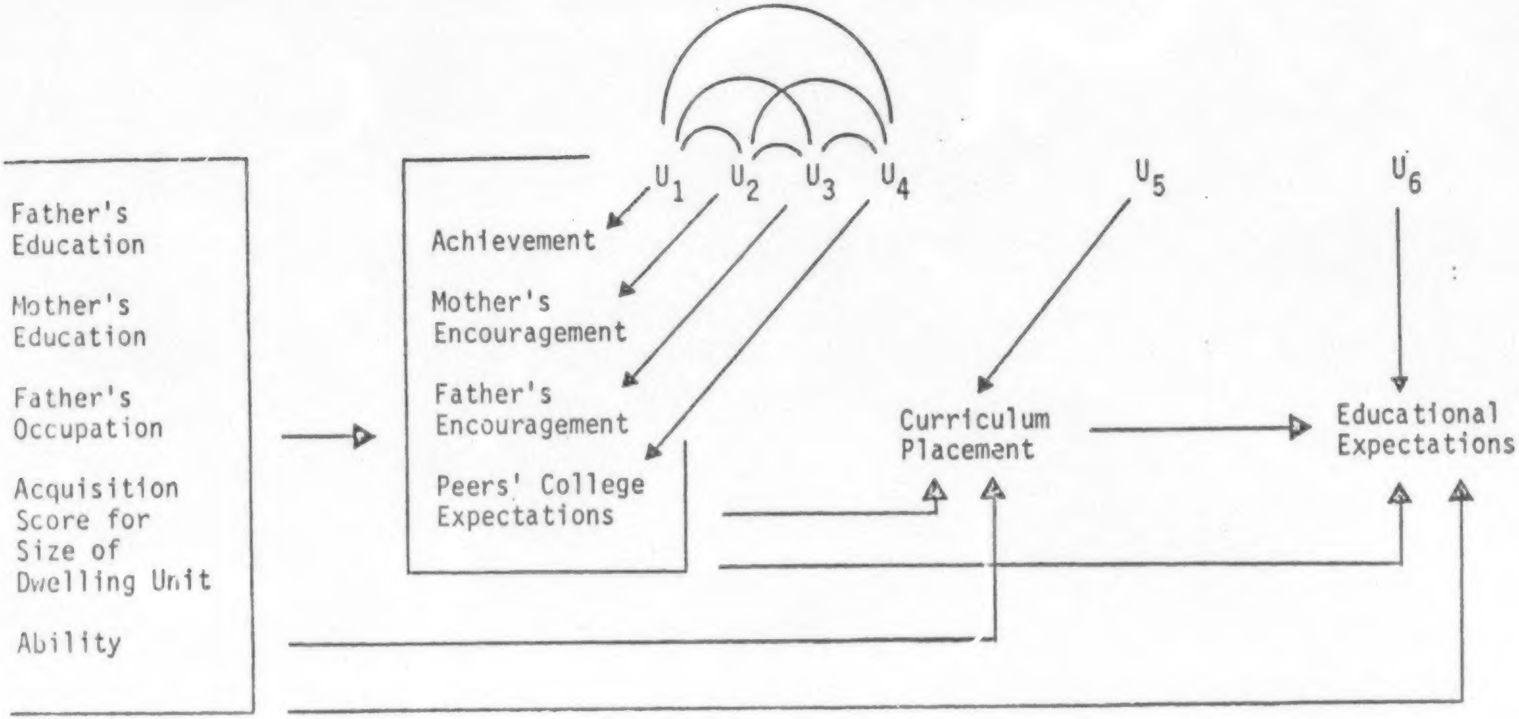
Earlier in commenting upon the "null" effects of schooling, we gave a very brief review of large scale studies of schooling (Coleman et al., 1966; Jencks, 1972; Hauser, 1971; Sewell, Haller, and Portes, 1969; Alexander and Eckland, 1975) and commented that effects of schooling have generally turned out to be small. This finding may reflect the truth. On other hand some clues suggest that the macro unit of analysis may obscure what it is that schools contribute to schooling. Also we noted that the period in the life cycle when schooling effects are largest may be the one least studied, i.e., the very beginning of the child's schooling career. Schooling effects may occur early and be relatively stable after only a few years in school. A third consideration, barely mentioned in passing, is the nature of the modeling process itself. Psychological research does not face up to the modeling issue at all. A couple of heuristic models have been proposed, not as a foundation for empirical research, but as departure points for discussion. The "models" are of the arm-waving type, used mainly to justify the inclusion or exclusion of variables in some two- or three-variable analysis. Fortunately another research genre, sociological studies of status attainment, point to a style of analysis and some structural features of models that contribute much to our understanding of the process of early attainment.

There is an established body of cumulative work regarding the school productivity process that is represented in Figure 3.1 (see Cook and Alexander (1978)). This model of adolescent education expectation formation is intuitively appealing and consistent with research from a number of sources (see Alexander, Eckland, and Griffin, 1975; Alexander and McDill, 1976; Kerckhoff, 1974; Sewell, Haller, and Portes, 1969; Sewell, Haller, and Ohlendorf, 1970; Sewell and Hauser, 1972, 1975). Here "educational expectations" --how far the student expects to go in school--is the ultimate dependent variable. Prior to it appear school track and two blocks of variables, one representing the effects of prior achievement and encouragement of significant others, the other representing ability and socioeconomic background. Without trying to review the enormous number of studies in the status attainment area, we will take this model as a representative type and point out exactly what features of it will be useful in developing our own models and what features of it are irrelevant. None of the previous models is isomorphic with our data reduction problem but the style of modeling itself will be enormously useful.

In the field experiments just reviewed in this chapter and in most of the research reviewed in Chapter 2, only the simplest kinds of time ordering were assumed. The opportunity to control extraneous variables was limited in all such studies. In an experiment one can block on sex or race, but after one or two such controls are incorporated, the limit of feasibility in terms of size (number of subjects) is reached.

Figure 3.1[b]

Model of Adolescent Educational Expectation Formation[a]


Father's Education
Mother's Education
Father's Occupation
Acquisition Score for Size of Dwelling Unit
Ability
Achievement
Mother's Encouragement
Father's Encouragement
Peers' College Expectations
U_1
U_2
U_3
U_4
U_5
U_6
Curriculum Placement
Educational Expectations

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[a] Variables are blocked for simplicity of presentation. The model is fully recursive; all prior variables directly affect all later ones. Variables within blocks are not assumed to be causally related, but their structural disturbances are assumed to be correlated due to the omission of variables which would simultaneously affect all of them.

[b] Figure 1 from Cook and Alexander, 1978.

By contrast, the provocative set of studies listed in Chapter 1 employed a style of modeling much like that seen in Figure 3.1. Murnane, for example, used several multiple regression analyses to tease out the influence of teacher characteristics net of background factors. (In Figure 3.1 by incorporating the first block of variables, one effectively "controls" on them in assessing the importance of variables later in the sequence.) So the idea of setting up a model with many variables in a specified temporal sequence, and the techniques for estimating the strengths of the links between variables in such a sequence, is a valuable legacy conferred by sociological research on status attainment.

Another benefit of this tradition is evidence concerning the potency of particular variables. In the particular model shown in Figure 3.1, "mother's encouragement" and "father's encouragement" are identified as sources of influence on educational expectations. These variables are closely tied to "parents' expectations," a variable explicitly conceptualized by Braun in his heuristic model, and also a variable we will pay attention to. In fact, studies with secondary students have almost universally incorporated the influence of significant others including peers. The exogenous variables in Figure 3.1 are likewise commonly seen in one form or another in models of secondary school attainment, but only vaguely mentioned, if at all, in psychological studies as "social class" or socioeconomic status. So this kind of model has a number of variables of particular interest to us.

The reader must be careful, however, not to leap from models like Figure 3.1 directly to the models we will later propose. For one thing, models like Figure 3.1 are longitudinal at best as two-wave panel designs, that is the same respondents are queried at two times, say about variables in the first two blocks at one time, and perhaps about curriculum placement and educational expectations later. Thus many of the variables assumed to be in a cause-effect relation, say the effect of ability on achievement, are measured simultaneously and then ordered with respect to time as the model is estimated. In some cases the ordering is logical--it is hard to see how mother's encouragement could affect dwelling unit. In other cases, however, the ordering is equivocal at best. Mother's encouragement could affect ability, and achievement could also affect ability because degrees of achievement may be necessary for some abilities to reach their full development. Even more precarious is the direction of the real force between educational expectations and curriculum placement. At worst these might even be reversed. We are going to be interested in the evolution of the schooling process over a three-year period and we will employ a multiwave sampling design, perhaps best tagged as six overlapping 2-wave panel designs. But the differences between our models and the traditional ones in status attainment will be made clear later. The point here is that this research genre has been enormously useful in suggesting some variables for attention and in providing a strategy of modeling. The research on teachers expectations has stimulated the development of heuristic models of the schooling process--two specific ones will be discussed in the next chapter--but the methodology for estimating such models has not been applied prior to our own work in this area. The next chapter presents a heuristic model to make explicit the conceptual grounding of our structural equation models. The structural equation models (Chapter 5) are explicit statements of our hypotheses concerning early schooling.

Altogether we will try in the next chapter to pull together the various strands of evidence available to us to formulate a heuristic model of the schooling process. The heuristic model will lead to a set of mid-range structural models in Chapter 5, mid-range in the sense that students will be matched to their particular teachers. We will employ a style of modeling reminiscent of that employed in macro studies of status attainment. The particular variables chosen for modelling will reflect the interpersonal processes known to be critical from examination of both the psychological and sociological literature--pupil's expectations, peer expectations, and the like--as well as social-structural conditions besides classrooms that are believed to be important such as the socioeconomic and racial background of the pupil.

CHAPTER 4

A HEURISTIC MODEL OF SCHOOLING

Causal models, though widely used in many branches of sociology and economics, are still rare in the other social sciences. Ideas about such models have recently started to filter into work on child development (Ambron and Rogosa, 1975), but for other fields the full promise lies in the future. In fact, our work with American data gathered from elementary school children is novel in this respect, and only Walberg and Marjoribanks (1976), who estimated a series of models with British data taken from the Plowden report, come anywhere close to using models with young children in ways that we are proposing to use them. Their research with British school children showed that initial reading achievement was by far the strongest predictor of later reading achievement. To our knowledge, causal models of the elementary educational process other than those cited in Chapter 1, have not been empirically tested although, as we indicated earlier, there have been many attempts to estimate similar models for secondary school students.

It will help organize what follows to present in this chapter a heuristic model of the schooling process. This model provides a springboard for the later presentation of a series of cyclic models that we will actually try to estimate. A heuristic model will help tie together previous research, whether on models or on the substance of schooling. Hopefully the model will focus discussion in such a way as to make clear our own research intentions while it informs the reader about prior research that bears on our own.

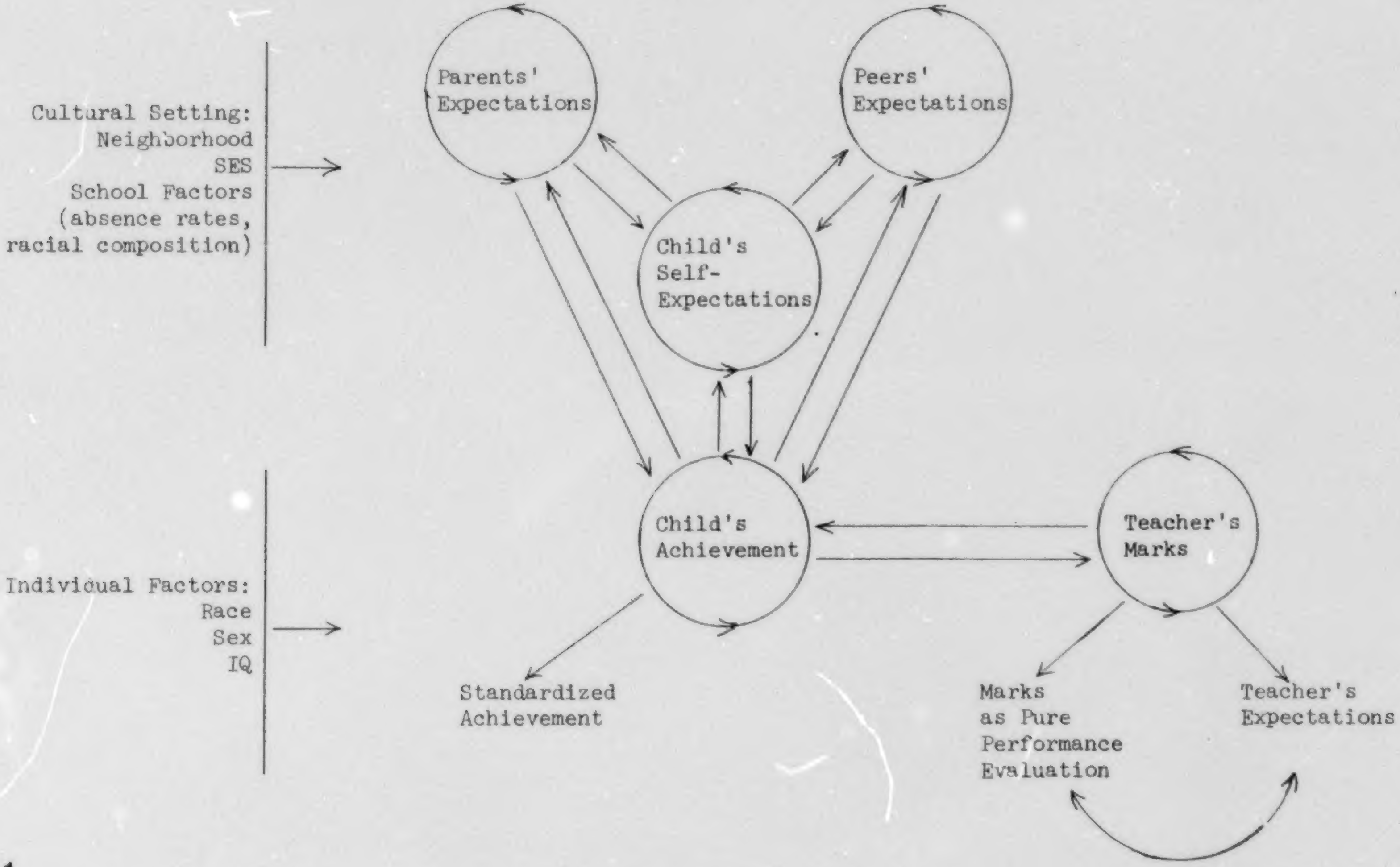
We offer as a heuristic model (Figure 4.1) a midrange model that incorporates both psychological and sociological variables. The model may take a different form depending on the social context in which schooling occurs. For example, race can be included in the model when children of more than one race are schooled jointly. In particular, cultural context may be expressly exogenous, shown as part of the causal process, or not shown at all because the whole model is "inside" the context. More of this later.

We will be concerned first mainly with specifying the structure of the schooling process, that is specifying structural relations among variables in the heuristic model. Discussion of exactly how variables in the model could be measured will be deferred until Chapter 5, but in this chapter we will try to make clear each variable's conceptual nature.

We believe the time is ripe for mid-range models of schooling. They need to incorporate both the social and psychological conditions affecting children. Schooling is a two-sided process. The pupil achieves as an individual but he does so in response to demands placed upon him by others and by himself largely as a consequence of his position in a social network. The network includes both a sociocultural context and the persons who are "significant others".

All influences on pupil achievement must be mediated by the student himself--the student learns because he hears, sees, feels, touches, and responds. If the socioeconomic context in which the student lives affects his school achievement, it must do so by affecting something about the pupil, his attitudes (he thinks adults are entitled to supervise

Figure 4.1


Cultural Setting:
Neighborhood
SES
School Factors
(absence rates,
racial composition)
Parents' Expectations
Peers' Expectations
Child's Self-Expectations
Child's Achievement
Teacher's Marks
Individual Factors:
Race
Sex
IQ
Standardized Achievement
Marks as Pure Performance Evaluation
Teacher's Expectations

children), his cognitive abilities (he learns a dialect at home that is different from the teacher's), his values (he thinks that an education is worthwhile), and so on. Socioeconomic context can be measured in many ways, and sometimes it has been measured e.g. in terms of the number of books in the home. But books in the home by themselves obviously do not cause achievement. Somehow what is in those books, or the fact that there are books there and so books are seen as "important," or children observe parents reading books, is what causes pupils to change. (In calling for this kind of specification, we follow Whiting (1975) in her plea for an "unpackaging" of social class. Social class of itself causes nothing--however it implies certain activities or certain outlooks that could serve as causes.) Also if significant others affect achievement they do so through some form of interaction with the student. Students learn because their parents importune them to learn or because their peers expect them to. They respond--learn things--mainly to please people, including themselves.

The schooling process involves the child in a series of complicated and interrelated events. The child comes to school with attitudes about himself, expectations about school, ways of dealing with authority figures, and also with certain rudimentary cognitive skills--for example, the child may know color names and letters of the alphabet. Once in school he tries to master the topics of the elementary curriculum, the most important being reading and arithmetic. Along with his classmates he is instructed in these matters daily. The child also spends part of each day at home and some schooling occurs there. At home he may also receive explicit instruction in academic subjects: he may complete homework assignments; he may play "school" or "library", he may amuse himself with academic puzzles and games; his parents may insist that he watch educational TV. Most events of this kind have both social and psychological compenents.

We intend to focus on two major outcomes of schooling: achievement outcomes, represented by proficiency in reading and arithmetic; and affective outcomes, including the child's image of himself as an academic person and his ability to "get along" with teacher and peers (school deportment).

Elements of the Model

Cultural Setting

These considerations, plus the fact that elementary schools are almost always neighborhood institutions, argue for two environmental influences in any heuristic model of the schooling process: one overarching variable describing the neighborhood and school setting (the cultural context of the school) and the other a set of home environment variables placed within the neighborhood context. For example, the school reflects the composition of the neighborhood by being integrated or segregated while the home can be one that provides (or does not provide) help with homework independent of the neighborhood context.

In our empirical work, "cultural setting" has been attended to in several ways. Most important, we studied children in three different schools in order to model possible effects of segregated vs. integrated schools and middle-class vs. lower-class neighborhoods. Several "family" factors differed among the schools, notably the socioeconomic and educational status of parents. We studied children who attended an all-white suburban school in a middle-class residential area, children who attended an integrated school in a lower-class urban area, and children who attended a segregated black school also in a lower-class urban area.

The "cultural context" could imply a vast set of influences that may "explain" SES differences in school achievement. We made no effort to investigate any of these explicitly. The list might include dialect cleavages (Baratz, 1970) or language barriers (Lambert and MacNamara, 1969), sociolinguistic customs (Bernstein, 1970), attitudes towards adults (H.F. Wolcott cited by Havighurst, 1970), cultural differences in authority relations (Wax, 1969), ability to defer gratification feelings of efficacy or control (Coleman et al., 1966), problem-solving styles (Hess and Shipman, 1965), attention to work and willingness to make "work-responses", the appeal of tangible vs. intangible rewards (Zigler and deLabry, 1962), and whether ego or others mediate rewards (see Havighurst, 1970, for a critical review of this).

One additional influence, brought sharply to our attention in the course of this study, may be of critical importance: informal school achievement norms. Our preliminary work (Entwisle and Hayduk, 1978) suggested that, for children of comparable ability levels who are starting school, achievement norms can be vastly different. Among the three schools we studied, in the integrated school 40% of the children received D's as a first mark in reading while in the middle-class school a mark of D was a rare event. In the integrated school, furthermore, parents did not expect their children to receive marks as high as those expected by middle-class parents. The difference in tested IQ level when children began school was not large enough to suggest such a huge difference in initial performance, and school facilities were similar. Therefore we began to suspect that the social climate, particularly informal norms, could be very influential in explaining the widely different levels of proficiency of children in different cultural milieux.

It seems likely, in fact, that a major way for cultural context to exert an effect on schooling is through beliefs and values about what is proper, and as a consequence, people's readiness to tolerate certain outcomes. It is often stated that minority-group members see themselves as pawns of fate, powerless to confront institutions such as schools. One consequence of this view is that if a minority-group child receives a D in reading, his parents do not protest it. We did observe, informally, strong differences among the schools in accountability of teachers to parents. In the middle class school especially, the principal was exceedingly sensitive to parent demands.

Other cultural factors related to linguistic habits may also act to encourage or discourage communications between parents and teachers. Hess (1970) points out that members of the lower-class avoid verbal interation with members of the middle class, and this avoidance, if our data are to be trusted, is certainly manifest in lower-class parents' relations with school. Lower-class parents in this study were much less likely than middle-class parents to be in close touch with the school. The cultural context could thus act not so much to discourage achievement as to prevent the exchange of information necessary to promote achievement.

Failure to appreciate school norms or the social distance between parents and school does not at all imply that lower-class parents are indifferent to middle-class values. For example, in a survey of lower-class black mothers in Philadelphia asking about "what they believed to be most important for a man to get ahead in his job" 82% selected the response "hard work and ambition" (Bell, 1975).

Thus it is not that middle-class values are eschewed by lower-class parents, but instead that to lower-class parents the ways for achieving goals are not clear--they do not seem to be aware that pressure from parents could likely change school marking norms or that a visit to the child's teacher might lead the teacher to rate the child more leniently.

Individual Characteristics

The perceived characteristics of the individual--race, sex, and possibly tested IQ scores--may have both direct and indirect effects on schooling. The model (Figure 4.1) shows these as a set of exogenous variables separate from cultural context. The child's race and sex (and often IQ) are there for all to see when he starts school, and could exert effects in several ways. For example, a child's race may affect teacher's marks directly because a white teacher may hold blacks to lower standards. A child's sex could affect marks directly because some teachers hold boys to different standards of conduct from girls, or to lower standards for reading from girls. There is evidence that girls do better than boys in early reading (Averch, Carroll, Donaldson, Kiesling, and Pincus, 1972).

Similarly, race and sex could have indirect effects on teachers' marks by several routes, for example, by affecting peers' expectations (white classmates may have low expectations for blacks that cause blacks to avoid action opportunities), by affecting parents' expectations (black parents may be pessimistic about the liklihood of their children's academic success and therefore not encourage their child to do extra work at home), or by affecting the pupil's expectations for himself (a black child may have high self-esteem in an all-black school and reflect this by seizing all learning opportunities offered).

Considerable prior evidence can be marshalled to support the kinds of conjectures just listed. Significant sex effects, for example, have been found in marks assigned (girls get higher marks than their twin brothers (V. Doma cited by Finn, 1972)) or in teachers' ratings of children's behavior in the first three grades (Alberti, 1971). Also boys are expected to do worse than girls in reading (Palardy, 1969) and are more often the targets of criticism and disapproval in first grade (Brophy and Good, 1970). Many of the studies indicating that race affects children's expectations were cited in Chapter 2 and while findings in this topic are far from unitary they bob up often enough to suggest that race (or ethnicity) should be in a heuristic model even if only to check on the absence of such effects.

Significant Others

Whether at home or at school the child is part of a group. And the group, whether it contains parents and siblings or teachers and peers, consists of "significant others" in the Mead-Cooley sense.

Notions about the looking-glass self derive directly from Cooley's (1922) and Mead's (1934) ideas about the individual's sources of self-concept. An individual's ideas regarding himself, including especially his overall self-evaluation, come from the opinions of others. Moreover, these others are not all thought to be equally important in determining the self-evaluation. Evaluations from a "significant others," to use Sullivan's (1947) term, are thought to be influential upon the individual while opinions of persons who are socially and emotionally distant are likely to be ignored.

There must be important effects when the child exhibits his elementary skills in the presence of significant others, for they evaluate him and perhaps reward him with attention and admiration. The child's self-regard and psychological well-being are intimately linked to the reactions he senses in those who care about him. The child whose parents praise his early attempts to read, for example, or who encourage him to try his hand at arithmetic, learns many things besides how to read or do arithmetic. He is learning how to win favor from his parents. He is also learning the kinds of activities that adults in his society generally value.

By the same token, in the classroom where the teacher is the adult "significant other," the child is being continuously evaluated. He shapes his activities according to the kind of feedback he gets. The teacher informs the child about the calibre of performance she expects and at the same time contributes to the child's evaluations of himself. If the child's behavior is approved, he learns the proper response and at the same time is pleased with himself. Cognitive and affective development go hand in hand. One outcome of the schooling process is the child's academic self-image. The other is his actual proficiency at reading and arithmetic, as we have already said. One consequence of the child's responsiveness to the expectations of his set of significant others, is the set of expectations he develops for himself. There is every reason to think reciprocal causation is the rule. For example, the teacher's expectations for the child affect the child's expectations, and then the child's expectations affect the teacher's expectations. The child who expects to do well impresses the teacher with his self-confidence, for example, because the teacher probably concludes the self-confidence has some basis.

Several other workers (see Finn, 1970, 1972; also Breland, 1970; Braun, 1976) present heuristic models that depict the net of expectations surrounding elementary school students in much the way that it is being described here. Our heuristic model is much like one presented by Finn (1972) which he adapted from Finn (1970) and Breland (1970), but Finn did not emphasize explicitly the model's dynamic nature nor did he develop it beyond a heuristic stage. In particular, Finn did not go on to test his model. The model proposed here (Figure 4.1) could turn into a different model in different cultural contexts. That is, in a lower-class setting peers' expectations may be important but the contrary be true in a middle-class setting. Thus, there could be structural connections in one setting but not in another. Our heuristic model presages equation models whose parameters will be estimated using a set of multiwave data.

Braun (1976) following Finn, developed a "micro model" for teacher expectations where all inputs to teacher expectations are individual-level variables, and where teacher expectations can then lead to actions directed at a particular pupil (expectant voice, prompting). For Braun, actions directed at the pupil and mediated through pupil self-expectation lead to output, whereas Finn seems to allow for direct effects of cultural milieu apart from their mediation through the network of significant others. Braun apparently does not intend to allow for indirect effects.

Braun's model has helped clarify our thinking but its dyadic nature puts it at the wrong level of analysis for our purposes. Teachers are not the only significant others, for example, and we would argue for a direct effect of sex on pupil's self-expectations as well as other direct effects from cultural context.

Perhaps the chief difference between our heuristic model and its conceptual predecessors is its purpose. Previous models were developed mainly to account for influence of teachers' expectations on "achievement" (Finn) or to elucidate the process by which teachers' expectations cause their effects (Braun). Our purpose is broader. We wish to model attainment over the first three years of school in two distinct areas, the cognitive and the affective-social. Also teachers' expectations can be dealt with only indirectly, mainly by the discrepancy between teachers' marks and standardized achievement test scores, because teachers expectations cannot readily be measured directly without prejudicing the observational process. In other words, if we asked teachers their expectations directly, we were afraid we would bias the observations in that teachers would try to make marks consistent or otherwise act in different ways because of our studying them.

Structure of the Model

With Figure 4.1 as a guide the various links in the model will now be discussed.

Cultural Setting

Farthest in the background is "cultural setting." This is meant to include the neighborhood and family environmental factors implied by "socioeconomic status," and also whether the school the child attends is integrated or segregated. The student's cultural context could exert effects on the schooling process in several ways, both directly and indirectly. (Finn implies this in his model but Braun sees all social context effects mediated through the individual.) Direct effects could occur because achievement norms might differ in one place as compared with another. Indirect effects could occur because children in lower-class settings may feel school achievement is unimportant or may have parents who think such achievement is unimportant (Stendler, 1951), and this could lead them to ignore feedback from teachers. Their schooling could thus hinge mainly on peers' reactions rather than teachers' reactions. By contrast, children in middle-class settings may pay little attention to peers. Actually the evidence on SES differences in school achievement suggests a multitude of causes for them and we have already briefly indicated the flavor of the findings.

Parents

Parents determine a number of characteristics of family life that may bear on schooling. These appear at two levels in the model. First, parents' socioeconomic status and occupation is, without exception, shown to be a significant source of variance in the many studies of status attainment of secondary school students, and although data on primary-school children are scarce, all the available evidence also points to strong parent effects. Relations with parents could also be important for school performance because of their contribution to the overall cultural context. They are *part* of the cultural context.

The parents are also implicated, at a separate point further along in the model, as one of the significant others. By their sanctions they could shape the child's early self-concept or achievement.

To represent parents' specific influence on reading and arithmetic achievement, parents' expectations for their children's performance--how well they expect the child to perform in a particular subject--appear as explicit variables. Parents' influence is documented in many studies (see Mosteller and Moynihan, 1972:40).

Individual Characteristics

Race, sex, and IQ could affect all the endogenous variables, as indicated by the arrow implying a direct link between all the individual characteristics and all later expectation and achievement variables. It is also clear, as pointed out earlier, that all of them may have indirect effects. Sex may operate on a child's expectations and thereby alter performance, or IQ the same.

Peers

We assume that informal relations among pupils, particularly peer liking relations, affect how students fill their role. A pupil's academic performance is partly conditioned by his self-concept *as peer*. Also the pupil's self-regard is predicted in part by peer's liking (Horowitz, 1962; Coopersmith, 1959).

Inclusion of peers in the model rests mainly on theoretical grounds supporting the existence of relationships between peer liking and pupil attitudes and achievement. There are a few studies, however, which demonstrate empirical associations between interpersonal processes of school peer groups, the psychological processes of individual pupils, and pupil behavior in the classroom (Sewell, Haller, and Straus, 1959; Wilson, 1959) or which show that in elementary school children low peer liking leads to a low utilization of academic abilities (Echelberger, 1959; Lippitt and Gold, 1959; Van Egmond, 1960; Schmuck, 1962, 1963). With very young children peer effects are sometimes absent (Bushwell, cited in Hoffman and Hoffman, 1966:245).

Children's Expectations

We include the child's expectations for himself as both an antecedent and a consequence. The child develops a set of expectations based on how others react to him. Some of the clearest evidence for a link between self-concept of ability and attainment is contained in Brokkover, Erickson, and Joiner, (1967:77). Over a six-year period correlations between the self-concept of ability and grade-point average range between .48 and .63, and these correlations were virtually unaffected when IQ and SES were partialled out.

Reciprocal Causation. As Figure 4.1 indicates, we see possible reciprocal causation between every pair of endogenous variables in this heuristic model. For example, if the child does well, we anticipate that his self-expectations will rise to reflect this. Also, if the child has high expectations for himself, we see this as a cause for parents and peers to hold higher expectations.

Obviously a child's race, sex, and initial measured IQ level cannot be changed so these variables are not the targets of reverse causation. IQ measures could be affected by a child's expectations or attainment, but for simplicity (and also because we lack the data to inform such a model) we measure achievement by teacher's marks and standardized tests and make no attempt to use IQ as an endogenous variable.

The heuristic model is intended to be general, that is to explain educational attainment of elementary school children no matter what their personal characteristics or social milieu. Obviously if children who attend one school are all black or all white, racial background or actors' races have little direct influence on the schooling process. By the same reasoning the social class background of pupils may be unimportant as long as pupils in one elementary school all come from similar home backgrounds. This is often the case in American elementary schools.

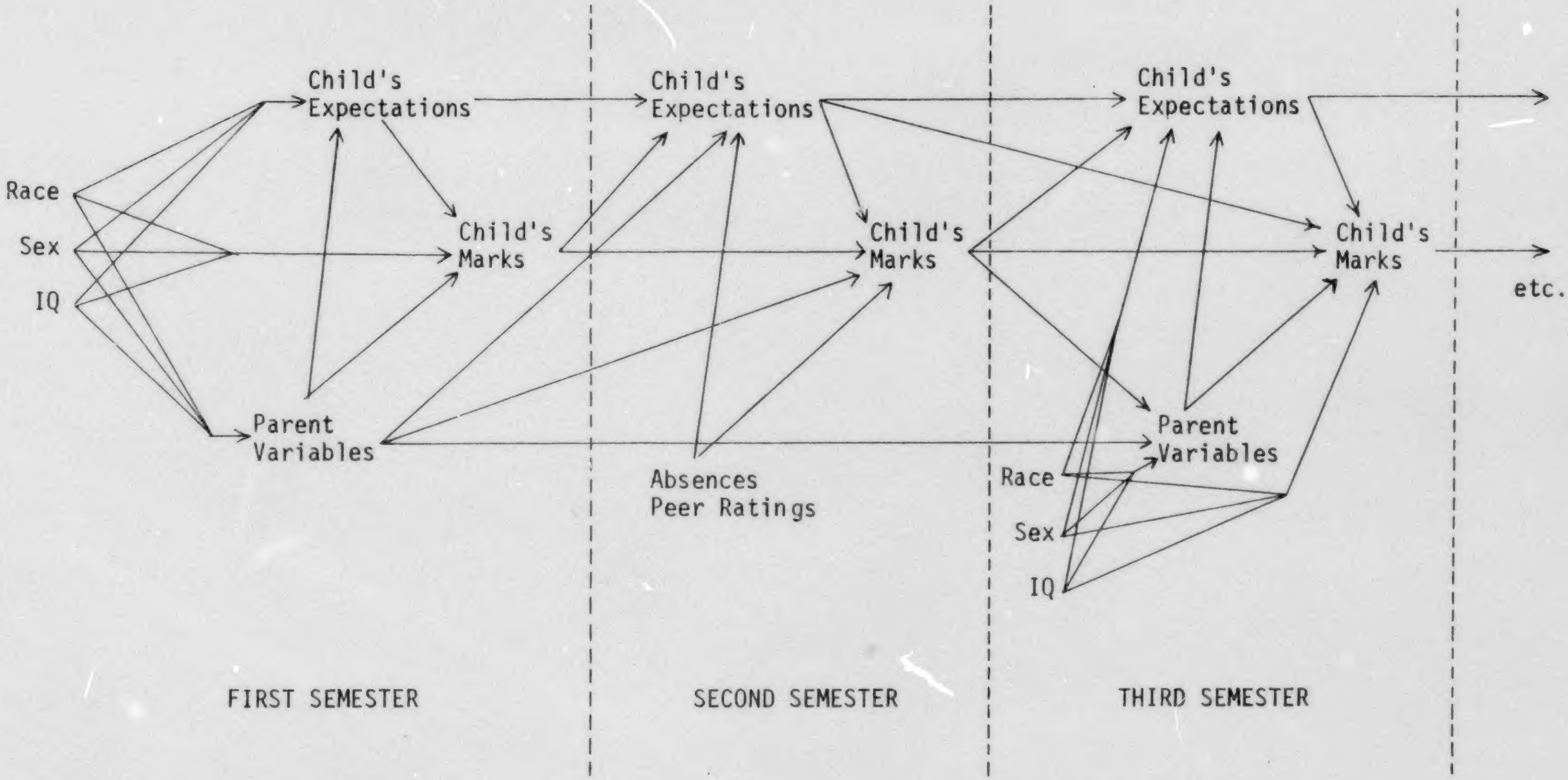
Looking for school effects on learning processes as well as on test performance leads to difficult problems in defining a model's parameters (see McPartland and Karweit, 1978), and we eventually skirt this issue by using similar but distinct models for each of three schools.

That is, we posit the same model (analogous to that shown in Figure 1) for each school but presume that the parameters may not be the same size nor the relationships necessarily the same in each of the three contexts. In fact, one way to detect school differences, if they exist, is by means of differences in model or parameter structure.

Time in the Model

A principal difference between our style of modeling and all previous models of school attainment is the conceptualization of time. In an effort to elucidate the schooling process and to disentangle some of the reciprocal effects posited in the heuristic model, as the reader will see, we stretched the heuristic model out along a time continuum that matches the schooling process (Figure 4.2). Structural equation models to be proposed in Chapter 5 are isomorphic with cycles of time, and to estimate the models we followed children from a time before they started first grade until the end of third grade. In the heuristic model no time indicators are included except that the two sets of exogenous variables (cultural and individual) are taken as prior to the endogenous variables. In order to disentagle reciprocal effects it is helpful to match closely the timing of some measurements with the time-frame governing some of the variables affecting schooling. We can then estimate what the causal effect of one variable may be on other variables that follow it in time. Also we can study variables in "time-series." For example, we can study what happens to a child's estimate of his own ability over time. The reciprocal causal influences depicted in the heuristic model are readily translated into the stylized time model.

Figure 4.2


Child's Expectations
Race
Sex
IQ
Child's Marks
Parent Variables
Child's Expectations
Child's Marks
Absences
Peer Ratings
Child's Expectations
Child's Marks
etc.
Parent Variables
Race
Sex
IQ
FIRST SEMESTER
SECOND SEMESTER
THIRD SEMESTER

The child's expectations before he is evaluated are assumed to affect the calibre of the child's performance (first marks in first grade). After the child is evaluated we expect that his expectations respond. In the stylized time model we therefore show a causal path from the child's initial expectations to his first marks, and then another arrow from first marks to expectations obtained later, in the latter half of first grade. Peers expectations appear as an exogenous variable introduced later in first grade, for it takes time for peers to form expectations, (we are not interested in explaining peers' expectations). Parents expectations, however, are present even before the child starts school, so they are the first endogenous variable.

In an important respect pointed out earlier, our heuristic model implies a kind of dynamic omitted from Finn's and related models: Each set of expectations is enclosed in a circle. On the circumference of each circle arrowheads point in a counterclockwise direction. This is to suggest that each of these variables is rolling along through time and is not static. The earlier models did not mean to imply that expectations remained fixed at any one level, but they do not allow for self-loops, expectations affecting expectations or marks affecting marks, and we wish to allow explicitly for persistence. There is good reason to expect that the first marks assigned to a child may directly influence later marks.

Also such self loops could have causal significance for expectations. For example, by the very process of voicing his expectations the child may become consciously aware of them and this awareness might cause marks to be interpreted differently from what otherwise would have been the case.

The model in Figure 4.2 will be elaborated further in Chapter 5, and a separate set of models will be estimated for each school. Why not model the process with school setting as an exogenous variable? That is "school" could be entered at the outset as a dummy variable, along with race and sex. This style of modeling would assume a common metric for achievement. There are problems with this because considerable evidence suggests the metric is not the same from school to school. A more serious problem is that such a modeling style would suggest more precision than our exploratory research warrants and focus attention away from different processes within schools. As the reader will see, one very important finding is that marks become much more stable in both the lower-class schools. To report this as a mark X mark X school interaction, where schools cannot be ranked along any particular continuum and where the metric for the interaction is arbitrary, struck us as questionable at best. In addition it multiplies the number of terms in structural equations to a number beyond what is sensible.

CHAPTER 5

SCHOOLING VARIABLES AND THEIR MEASUREMENT

Schooling may be viewed in many different ways. Surely, for the elementary school child, one of the most important ways has to do with children's success in mastering the basic skills, how well and how quickly they can read and do simple arithmetic. Another has to do with the ideas children forge about their own competence. We strongly suspect that eventual status attainment, or even short-run attainment on the next rung of the education ladder, depends on both the absolute level of achievement and on children's conceptions of their own ability. These notions, and the available literature bearing upon them, have been dealt with at length in earlier chapters and used to construct a heuristic model. It is now time to make our ideas about schooling explicit and to state them in a form susceptible to empirical test. To do this we will propose a set of cyclic structural equation models.

The guiding conceptual scheme in formulating our models is the one implied by the heuristic model: as children mature and pass through educational institutions, schooling comes about as a consequence of social interaction between the child and significant others. This interaction occurs in a definite time frame. We used this frame as a guide in formulating our models and also as a guide for carrying out measurements. The timing of the various measurements as shown in Figure 5.1 *corresponds exactly* to the time when data were actually collected. That is, parents were questioned in the fall of each year before the child was interviewed, and interviews to determine expectations

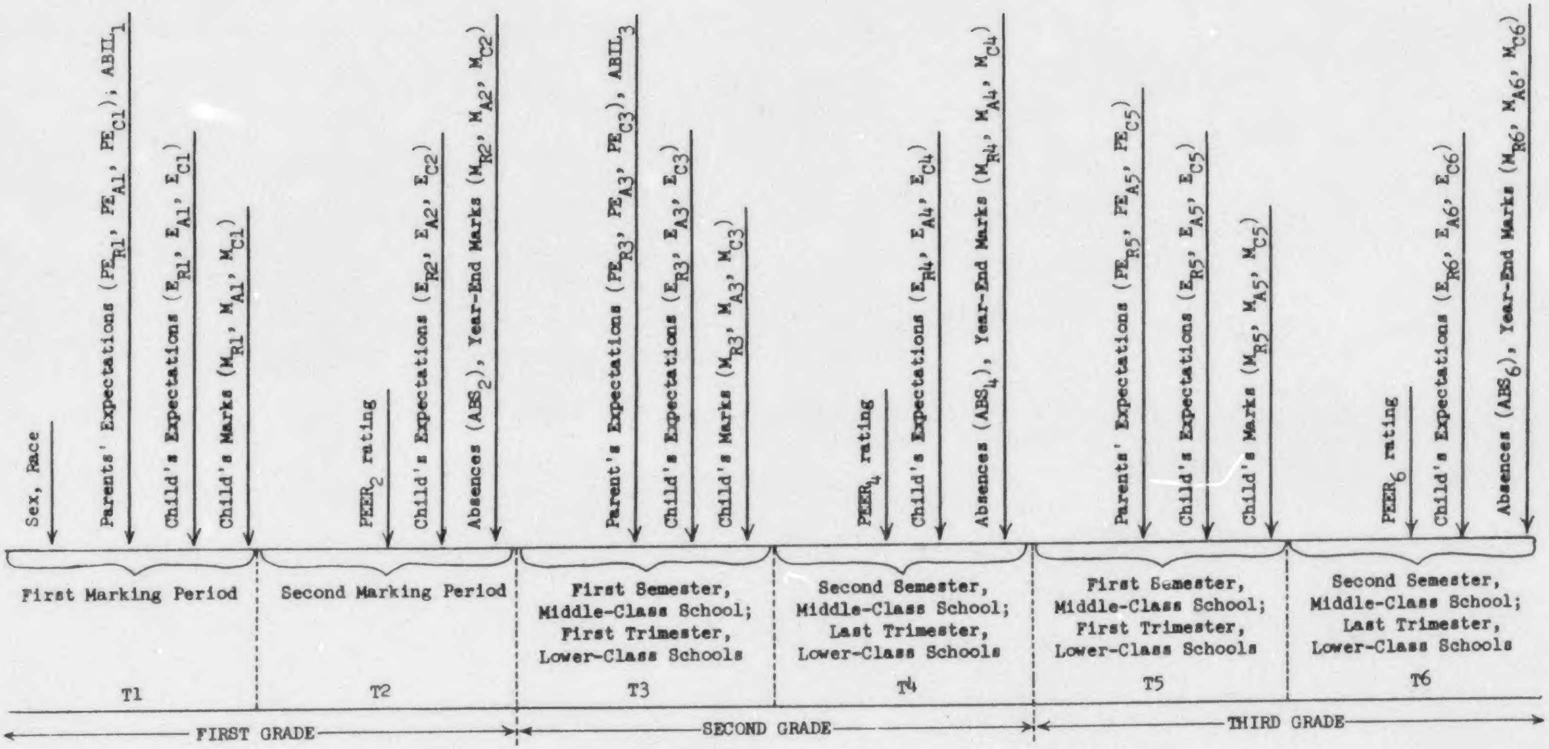

Sex, Race
Parents' Expectations (PE_{R1}, PE_{A1}, PE_{C1}); $ABIL_1$
Child's Expectations (E_{R1}, E_{A1}, E_{C1})
Child's Marks (M_{R1}, M_{A1}, M_{C1})
$PEER_2$ rating
Child's Expectations (E_{R2}, E_{A2}, E_{C2})
Absences (ABS_2), Year-End Marks (M_{R2}, M_{A2}, M_{C2})
Parent's Expectations (PE_{R3}, PE_{A3}, PE_{C3}), $ABIL_3$
Child's Expectations (E_{R3}, E_{A3}, E_{C3})
Child's Marks (M_{R3}, M_{A3}, M_{C3})
$PEER_4$ rating
Child's Expectations (E_{R4}, E_{A4}, E_{C4})
Absences (ABS_4), Year-End Marks (M_{R4}, M_{A4}, M_{C4})
Parents' Expectations (PE_{R5}, PE_{A5}, PE_{C5})
Child's Expectations (E_{R5}, E_{A5}, E_{C5})
Child's Marks (M_{R5}, M_{A5}, M_{C5})
$PEER_6$ rating
Child's Expectations (E_{R6}, E_{A6}, E_{C6})
Absences (ABS_6), Year-End Marks (M_{R6}, M_{A6}, M_{C6})
First Marking Period
Second Marking Period
First Semester, Middle-Class School; First Trimester, Lower-Class Schools
Second Semester, Middle-Class School; Last Trimester, Lower-Class Schools
First Semester, Middle-Class School; First Trimester, Lower-Class Schools
Second Semester, Middle-Class School; Last Trimester, Lower-Class Schools
T1
T2
T3
T4
T5
T6
FIRST GRADE
SECOND GRADE
THIRD GRADE

Figure 5.1

of parents and children both preceded the appearance of report cards. In the latter part of each school year, around April, peer ratings were obtained. Subsequently children were interviewed to obtain their expectations. Finally at the end of the school year, absence figures and final marks were obtained from year-end report cards.

We re-emphasize that data were collected on all these separate occasions in order to correspond exactly with the assumptions about the timing of effects in the models. Insofar as possible, children were followed continuously through the entire three-year period.

Although schooling outcomes are many, we will concentrate on two, operationalized as the variables M (marks given by teachers) and E (the child's expectations).

The reasons are clear for concentrating on marks in reading and arithmetic, for they form the heart of the elementary school curriculum, particularly in the first three grades. The child's marks in reading and arithmetic are taken as two "cognitive" outcomes.

The conduct mark can be taken as an indicator of the level of the child's social development, as one of the "affective" outcomes of schooling. Also how children behave in school may help or hinder their performance in reading and arithmetic, so marks the teacher gives the child in conduct will be useful in estimating what portion of the child's reading or arithmetic mark may be owing to the child's non-academic qualities. The child's expectations for his own performance in reading, arithmetic, and conduct, are taken as three further "affective" outcomes.

The expectation and mark variables that will appear together with seven other variables in the structural models are: RACE, the child's race; SEX, the child's sex; IQ, IQ as measured on any one of several standardized tests; ABIL, parent's estimate of the child's ability to do schoolwork, PE, the parent's expectations of his child's performance; E, the child's expectations for his own performance; M, the marks given by the child's teacher; PEER, the average judgment of reading ability by a child's classmates; ABS, the number of absence (days) in one school year. In pilot work, marks in two other academic areas, "spelling" and "language", were included. They were eventually dropped because neither teachers nor students had clear ideas about exactly what was being evaluated under these rubrics. By examining reading and arithmetic marks, then, we believe we are covering all the important academic information available for first graders.

Precisely because teachers are likely to be influenced by a child's appearance and demeanor and because teachers vary in the marking standards they apply, school systems routinely evaluate children's reading and arithmetic skills with standardized tests by the end of third grade. Later, in Chapter 7, we will demonstrate that children's marks in reading and arithmetic as given by the teachers included in this study did predict the children's performance on standardized achievement tests. In the basic models to be presented in Chapter 6, however, we will consider teacher marks in reading and arithmetic as the main achievement criteria.

Since we are concerned with marks in three areas, we are also concerned with expectations in those same three areas. We inquired of children what expectations they held for themselves in reading, arithmetic, and conduct. Specifically, shortly before the report card was issued we asked what marks they expected their forthcoming report cards would show in these three subjects. We similarly asked parents (usually the mother) about their expectations for their child's performance in each of the same three areas before reports appeared.

Some variables used in preliminary models were later eliminated. For example, a 3-factor test of self-esteem (Dickstein, 1972), especially developed for use with young children, was tried out but eventually eliminated. We thought that this test of self-esteem might be better than previously developed tests because it was based on a carefully worked out theory and it had three separate factor scores for boys and three for girls. Nevertheless it did not add much to our ability to account for children's marks or self-expectations and its erratic patterns of relationships with other variables prompted misgivings about its construct validity. A number of other variables, such as total number of years of schooling parents expected their children to attain, whether parents intended to help with homework, how many of their children's friends parents knew, their family patterns of interacting, and so on, were also put on trial and later eliminated for the same kinds of reasons. Kindergarten teacher forecasts also proved ineffective as predictors. Because our research is largely exploratory, the impotence of a variable may be of as much interest to the reader as the potency of the variables surviving, and information is available directly from the authors.

RACE, PEER, SEX, IQ, and ABS all exogenous variables, will be thoroughly discussed. Although RACE had what we judge to be negligible effects, for theoretical reasons and because the variable has played a large role in the recent literature, it was included and estimated in all models for the integrated schools.

Variable Descriptions

A brief description of variables used in our models will now be given. (See also the later section "Issues of Measurement" in this chapter.)

RACE. This variable was coded "0" for white, "1" for black. All Orientals and Hispanics were classed as white.

SEX. This variable was coded "1" for boys, "2" for girls.

IQ. These were scores from a variety of tests given in the different schools at various times. A summary of the nature of these tests and the time of their administration is given in Table 5.1.

ABIL. Parents of each child (usually the mother) were asked, "How do you rate your child in school ability compared with other children in this school?" (Check one)

( ) Among the best
( ) Above average
( ) Average
( ) Below Average
( ) Among the Poorest

The responses were coded from 1 (Among the best) to 5 (Among the poorest).

PE, Parents' Expectations. The parents of each child were presumed to have expectations for how well their child would perform in reading, arithmetic, and conduct. Parents were asked to fill out a questionaire (or if necessary queried by an interviewer who filled out the questionnaire for them) indicating these expectations. Figure 5.2 reproduces part of the questionnaire that tapped parents' expectations. When necessary, interviewers interpreted to the parents the marking standards used by the school and answered questions parents asked.

Table 5.1

IQ Tests Used in Models[a]

Year Entered First Grade	First Grade Test	Second Grade Test
White Middle-Class School		
1971-1972	PMA	---
1972-1973	PMA	COG
1973-1974	PMA	COG
1974-1975	---	
1975-1976	---	
Integrated Lower-Class School		
1972-1973	PMA	COG
1973-1974	PCAT	COG
1974-1975	PCAT	
1975-1976	---	
Black Lower-Class School		
1973-1974	PCAT	COG
1974-1975	PCAT	
1975-1976	---	

[a] PMA = Primary Mental Ability Test

PCAT = Primary Cognitive Abilities Test (Form 1) (Houghton-Mifflin)

COG = Cognitive Abilities Test (Houghton-Mifflin)

Figure 5.2

JOHNS HOPKINS UNIVERSITY
PARENT OPINIONNAIRE--Confidential

Name of Student ______________________________ Room __________

Parent filling out questionnaire:

______ Mother

______ Father

This student has ____ older brothers

____ older sisters

____ younger brothers

____ younger sisters

(Please enter a number in each blank space above.)

Below is part of a report card like the one your child will bring home before long. Please fill in the boxes with marks (A, B, C, D, U, or 1, 2, 3) to show what you guess your child's next report card will look like.

For reading and arithmetic enter one of the following marks:

A - outstanding, very good

B - good

C - satisfactory

D - poor

U - unsatisfactory

For conduct enter one of the following marks:

1 - good

2 - satisfactory

3 - unsatisfactory

Please guess the marks your child will receive as accurately as you can.

BALTIMORE CITY PUBLIC SCHOOLS
Progress Report

School (name of school)

Pupil (your child's name)

Teacher (teacher's name)

Subjects	Marks
READING	
MATHEMATICS (ARITHMETIC)	
CONDUCT	

Enter A,B,C,D or U.

Enter 1,2, or 3.

Data were gathered only once a year from parents, shortly before the first report card was issued in the fall, by interviewers whose race usually matched that of the parent. Data from parent interviews were procured at T1, T3, and T5. Parents' interviews preceded children's interviews. (Children were interviewed twice during each grade, parents once.) Parents' expectations were coded from "1" (high) to "4" (low).

E, Children's Expectations. Just before their earliest report cards were issued in first grade, children were queried about their own expectations for their forthcoming marks in reading, in arithmetic, and in conduct. Each child was presumed to have some notion of how well he would perform in each area. A trained interviewer, whose race usually matched that of the child, conducted an individual interview with each child. Using a large stylized plastic replica of a report card and cardboard squares containing large numerals, she explained to the child what report cards are, what marks are, how marks are coded, and if necessary what "reading", "arithmetic" and "conduct" mean. She then asked each child to "play a game" in which the child tried to guess what marks his forthcoming report card should show in reading, in arithmetic, and in conduct, by placing the cardboard squares on the big "report card". Great care was taken that the children understood the task and understood the meaning of both "marks" and "report cards."

This interview provided the Time 1 (T1) measure of children's expectations. Children's expectations were coded in the same manner as parents'--from "1" high or A, to "4" low or D.

Later in first grade, just before the year-end report card was issued, children were again individually interviewed in an identical manner and asked to make the same kinds of guesses concerning the marks they expected to receive on the last report card of that school year. The second interview provided the Time 2 (T2) measure of children's expectations.

This same kind of individual interview yielded all data for children's expectations--E_R, E_A, E_C--at subsequent time points, T3 and T4 for second grade, and T5 and T6 for third grade. Expectations were always procured shortly before the relevant report cards were issued.

Marks. Children's marks in reading, arithmetic, and conduct, as well as their sex, race, IQ scores, and number of absences, were ascertained from school records.

Marks on the first report card in first grade are "T1 marks." Marks on the last report card in first grade are "T2 marks." During second and third grades, marks were again recorded at some point in the middle of the year and at the end of the year. The mid-year marks were recorded either one-third or one-half way through the year, depending on whether the school used three or four marking periods per year.

All marks, like expectations, were recorded on a scale from 1 to 4, with 1 high. (See Tables 5.2, 5.3 and 5.4)

PEER. The average rating of a child's reading ability by his classmates was obtained in different ways over the course of the study. Mainly it was procured by noting the order in which children chose up sides "to play a reading game." Two captains, a boy and a girl, were first selected by the teacher according to whom she judged best in the class in reading and social maturity. Captains then took turns picking

Table 5.2

Means and Standard Deviations of the Basic Variables for the Middle-Class School

	T1			T2			T3			T4			T5			T6		
	(Gr. 1--Midyear)			(Gr. 1--Year End)			(Gr. 2--Midyear)			(Gr. 2--Year End)			(Gr. 3--Midyear)			(Gr. 3--Year End)		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Marks																		
Reading	380	1.82	0.56	387	1.67	0.62	332	1.89	0.57	335	1.61	0.56	259	1.80	0.52	269	1.66	0.52
Arithmetic	380	1.85	0.51	387	1.65	0.59	338	1.97	0.50	341	1.85	0.57	268	1.88	0.51	276	1.75	0.55
Conduct	380	1.80	0.66	384	1.65	0.69	337	1.63	0.67	341	1.58	0.65	268	1.96	0.57	276	1.80	0.65
Child's Expectations																		
Reading	408	1.60	0.77	385	1.55	0.63	344	1.65	0.59	330	1.71	0.61	270	1.78	0.52	256	1.74	0.60
Arithmetic	408	1.79	0.78	385	1.69	0.76	344	1.69	0.73	330	1.74	0.70	270	1.81	0.64	256	1.89	0.73
Conduct	408	1.71	0.86	386	1.58	0.65	344	1.73	0.72	330	1.65	0.58	270	1.74	0.61	256	1.79	0.54
Parent's Expectations																		
Reading	348	1.78	0.63				271	1.71	0.61				222	1.68	0.57			
Arithmetic	348	1.80	0.63				270	1.86	0.62				223	1.81	0.50			
Conduct	343	1.78	0.61				271	1.77	0.62				223	1.76	0.59			
Peer Rating	364	0.49	0.30				332	0.57	0.31				271	0.63	0.30			
Absence	302	8.64	5.94				336	8.04	6.17				271	9.56	7.62			
IQ	237	112.99	11.07				102	104.12	11.47				176	112.09	14.09			

Table 5.3

Means and Standard Deviations of the Basic Variables for the Integrated Lower-Class School

	T1 (Gr. 1--Midyear)			T2 (Gr. 1--Year End)			T3 (Gr. 2--Midyear)			T4 (Gr. 2--Year End)			T5 (Gr. 3--Midyear)			T6 (Gr. 3--Year End)		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Marks																		
Reading	341	3.31	0.77	404	2.76	1.02	242	3.11	0.85	297	2.96	0.95	156	3.02	0.90	214	3.08	0.83
Arithmetic	397	3.00	0.72	408	2.71	0.89	287	3.14	0.69	302	2.79	0.84	204	2.94	0.82	209	2.68	0.99
Conduct	393	1.87	0.68	411	1.76	0.69	288	2.05	0.73	301	1.86	0.81	205	1.91	0.59	211	1.91	0.65
Child's Expectations																		
Reading	364	1.46	0.76	350	1.48	0.75	286	1.46	0.75	245	1.66	0.75	211	1.70	0.78	151	1.74	0.79
Arithmetic	365	1.70	0.72	351	1.70	0.82	284	1.72	0.78	245	1.81	0.78	212	1.86	0.85	151	1.85	0.84
Conduct	365	1.16	0.38	352	1.37	0.56	285	1.45	0.63	245	1.43	0.58	212	1.48	0.55	151	1.66	0.60
Parent's Expectations																		
Reading	348	2.44	0.76				257	2.39	0.74				170	2.33	0.81			
Arithmetic	349	2.36	0.74				259	2.41	0.68				170	2.39	0.73			
Conduct	348	1.70	0.66				260	1.78	0.70				171	1.81	0.63			
Peer Rating	327	0.49	0.30				211	0.61	0.31				162	0.64	0.29			
Absence	422	21.42	18.83				307	20.98	17.55				214	22.28	20.42			
IQ	281	97.10	16.01				177	82.54	13.04				164	89.85	13.09			

Table 5.4

Means and Standard Deviations of the Basic Variables for the Black Lower-Class School

	T1 (Gr. 1--Midyear)			T2 (Gr. 1--Year End)			T3 (Gr. 2--Midyear)			T4 (Gr. 2--Year End)			T5 (Gr. 3--Midyear)			T6 (Gr. 3--Year End)		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Marks																		
Reading	220	2.96	0.87	239	2.97	0.78	105	2.86	0.86	129	2.88	0.86	105	2.89	0.61	166	2.84	0.78
Arithmetic	231	3.01	0.66	250	2.75	0.93	173	3.08	0.59	178	3.01	0.74	165	2.98	0.66	171	2.88	0.82
Conduct	243	2.12	0.61	262	2.04	0.72	174	1.77	0.57	177	1.69	0.63	165	1.79	0.68	172	1.72	0.71
Child's Expectations																		
Reading	260	1.53	0.82	191	1.52	0.79	183	1.48	0.75	126	1.63	0.74	158	1.68	0.73	130	1.67	0.72
Arithmetic	260	1.78	0.84	191	1.77	0.84	183	1.80	0.85	126	1.78	0.86	158	1.71	0.82	130	1.93	0.86
Conduct	260	1.33	0.57	191	1.30	0.54	183	1.27	0.52	126	1.37	0.55	158	1.44	0.53	130	1.57	0.56
Parent's Expectations																		
Reading	90	2.39	0.77				79	2.54	0.78				114	2.46	0.88			
Arithmetic	88	2.39	0.70				79	2.48	0.71				113	2.51	0.75			
Conduct	92	1.78	0.75				79	1.92	0.66				114	1.72	0.63			
Peer Rating	238	0.50	0.30				160	0.67	0.30				150	0.65	0.31			
Absence	265	20.68	15.28				189	18.17	14.84				175	13.78	13.84			
IQ	187	90.11	14.41				64	91.05	14.76				70	90.50	10.87			

people to be on their team to play a relay game that, they were forewarned, called for reading skills.

This variable was scored separately for each classroom as follows. First all children were ranked in order in which they were chosen. There were pairs of ranks because of the two teams. That is, the two captains were ranked 1.5, the two children chosen first by each captain were ranked 3.5, and so on. Then each child's rank was normalized to lie between zero and one, with the highest ranks scored zero, the lowest scored one, and the others located at equal intervals between. In a class with 22 students, 2 would receive zero, two could receive one, and the 18 lying within the extreme would receive scores of .10, .20, .30, and so on.

ABSENCE.* This is the total number of absences for the entire school year as recorded on the year-end report card.

Social Context

An important part of our conceptual scheme is that the child's social milieu--the race and SES composition of this school and neighborhood--may affect the schooling process. Specifically, we wish to allow for the possibility that the schooling process is different in different social contexts. Middle-class children might be responsive to parents' expectations, for example, while lower-class children are not. Or absences from school may impair performance in a lower-class school but not in a middle-class school. Whatever the case, to get some idea about possible SES and race effects, models were estimated separately with data collected from three different schools: a white middle-class suburban school, an integrated lower-class urban school, and an all-black lower-class urban school. Characteristics of the three schools and their clienteles are given in Table 5.5 using data excerpted from an accountability summary required of all schools by the Maryland Department of Education for 1973 to 1975 inclusive. These published data are close to our own earlier estimates based on 1970 Census data (See Entwisle and Hayduk, 1978), but are probably more accurate than our own estimates because they cover only families with children enrolled in school rather than all families within a Census tract. Also school catchment areas, besides not being exactly contiguous with Census tract boundaries, vary somewhat from year to year.

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*This variable is discussed further later in this chapter.

All data on school facilities point to comparability among schools--enrollment, pupil-staff ratios, and teachers' qualifications are highly similar from one school to another. By contrast, all data pertaining to students or their families point to lack of comparability between the all-white suburban school and the two urban schools, but close comparability between the two urban schools. The surburban school significantly outranks its urban counterparts on these three measures.

Summary pupil test data (non-verbal ability test (SAS), grade equivalent (GE) scores on vocabulary, reading comprehension, and mathematics) given in Table 5.6 also show similar pictures for the two urban schools, but a different picture for the suburban school, with the suburban school considerably higher on all measures. The reported

Table 5.5

Maryland Accountability Program Report Statistics

	SAS (non-verbal IQ)	Vocabulary		Reading Comprehension		Mathematics	
		Grade Equivalent	Predicted G.E.[a]	Grade Equivalent	Predicted G.E.[a]	Grade Equivalent	Predicted G.E.[a]
1973-1974							
White Middle-Class Sch.	113.1	4.50	4.38	4.60	4.47	4.30	4.35
Integrated Lower-Class Sch.	90.4	2.40	2.90	2.73	2.94	2.93	3.10
Black Lower-Class Sch.	86.7	2.61	2.70	2.82	2.71	2.89	2.91
1974-1975							
White Middle-Class Sch.	110.7	4.70	4.22	4.80	4.32	4.60	4.23
Integrated Lower-Class Sch.	89.5	2.74	2.86	2.76	2.89	3.04	3.00
Black Lower-Class Sch.	87.4	2.40	2.72	2.56	2.75	2.80	2.88

[a] Predicted G.E. (grade equivalent) norm derived by regressing SAS on G.E.

Table 5.6

Maryland Accountability Program Report Statistics

	School Enroll-ment	Pupil Staff Ratio	Average Daily Attend-ance (%)	Average Experience of Teachers (Years)	Staff Masters Degree or Above (%)	% Disad-vantaged	Mother's Median Education	Median Family Income
1973-1974								
White Middle-Class School	659	20.7	97.1	10.1	28.3	2.2	12.5	$14,869
Integrated Lower-Class School	784	24.9	88.8	11.1	28.6	29.3	10.0	$7,435
Black Lower-Class School	776	25.0	92.3	14.1	19.3	26.8	10.0	$7,952
1974-1975								
White Middle-Class School	644	21.6	96.4	11.4	26.8	2.1	12.4	$14,868
Integrated Lower-Class School	742	22.8	87.5	9.4	18.5	29.4	9.9	$7,434
Black Lower-Class School	720	22.1	91.7	14.0	24.5	26.8	10.0	$7,951

differences between the suburban and the urban schools are greater in third grade, for which accountability data are provided, than in first grade for which we collected data ourselves. (Compare values in Table 5.2, 5.3 and 5.4 with those in Table 5.6).

The information on school characteristics appraizes the reader of the distinct character of the three schools. They were deliberately chosen as exemplars of three types of schools commonly found in the United States.

Average Values of Variables

The means and standard deviations for variables described earlier are given by time cycles in Tables 5.2, 5.3, and 5.4. (Tables 6 A.1 to 6 A.18 give the covariances, correlations and pair-wise present numbers of observations.) Because the IQ scores reported in Tables 5.2, 5.3 and 5.4 are based on only part of the sample, the reader may wish to consult Table 5.5 for average values by school.

Expectations. Children's expectations in reading and arithmetic are remarkably similar by the end of grade three in all three schools and the slight differences in level that exist are in the direction of more conservative expectations for middle class children (See Figures 5.3, 5.4, 5.5). In each school the trend from first to third grade is mildly downward. The expectations of children in both lower class schools were higher to start with, however, so their expectations on the average drop a little more, especially in the integrated school. Patterns noted for the two academic areas are accentuated for conduct--

Figure 5.3

Average Marks and Children's Expectations
Over Period of Study for Middle-Class School

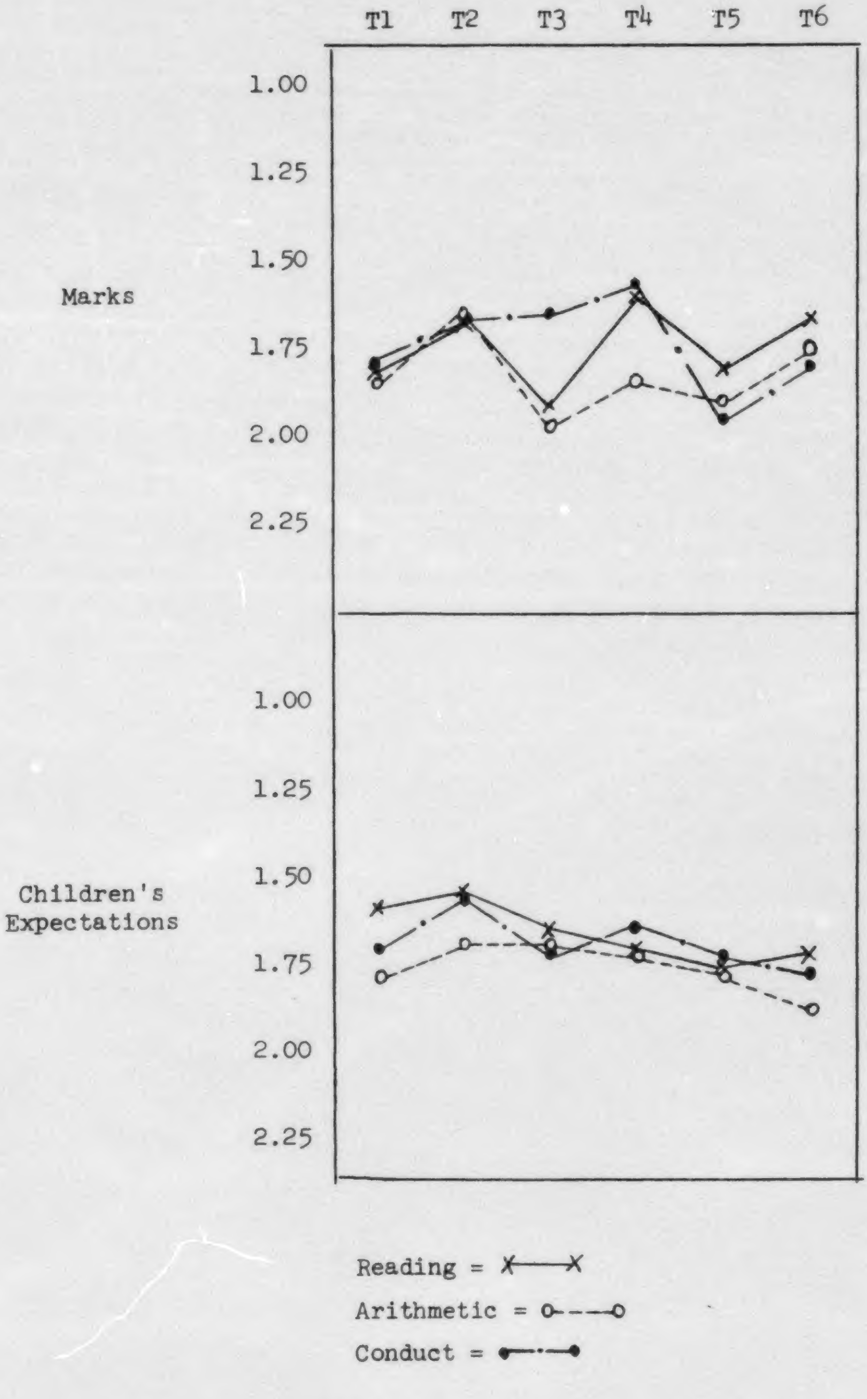
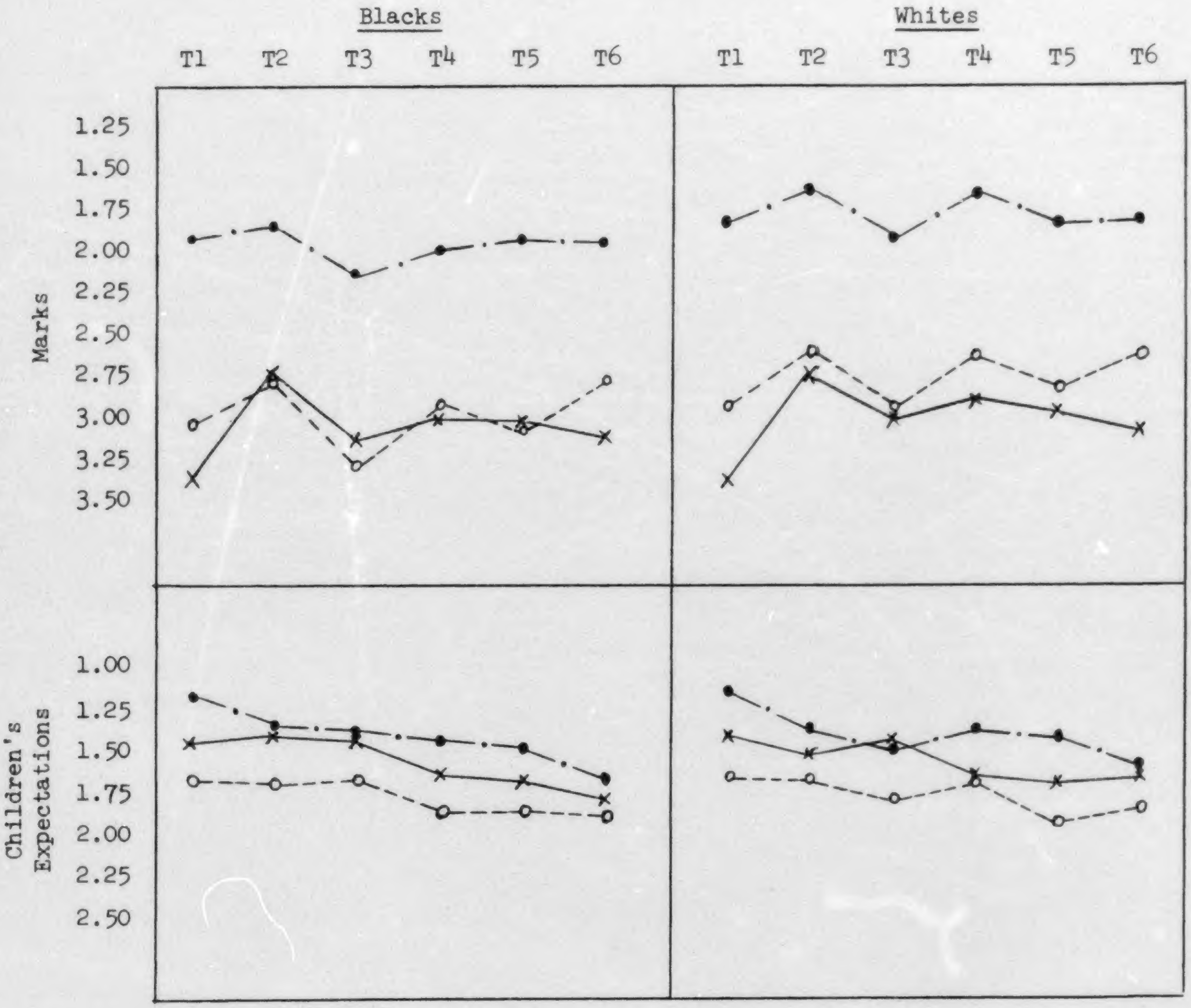


Figure 5.4

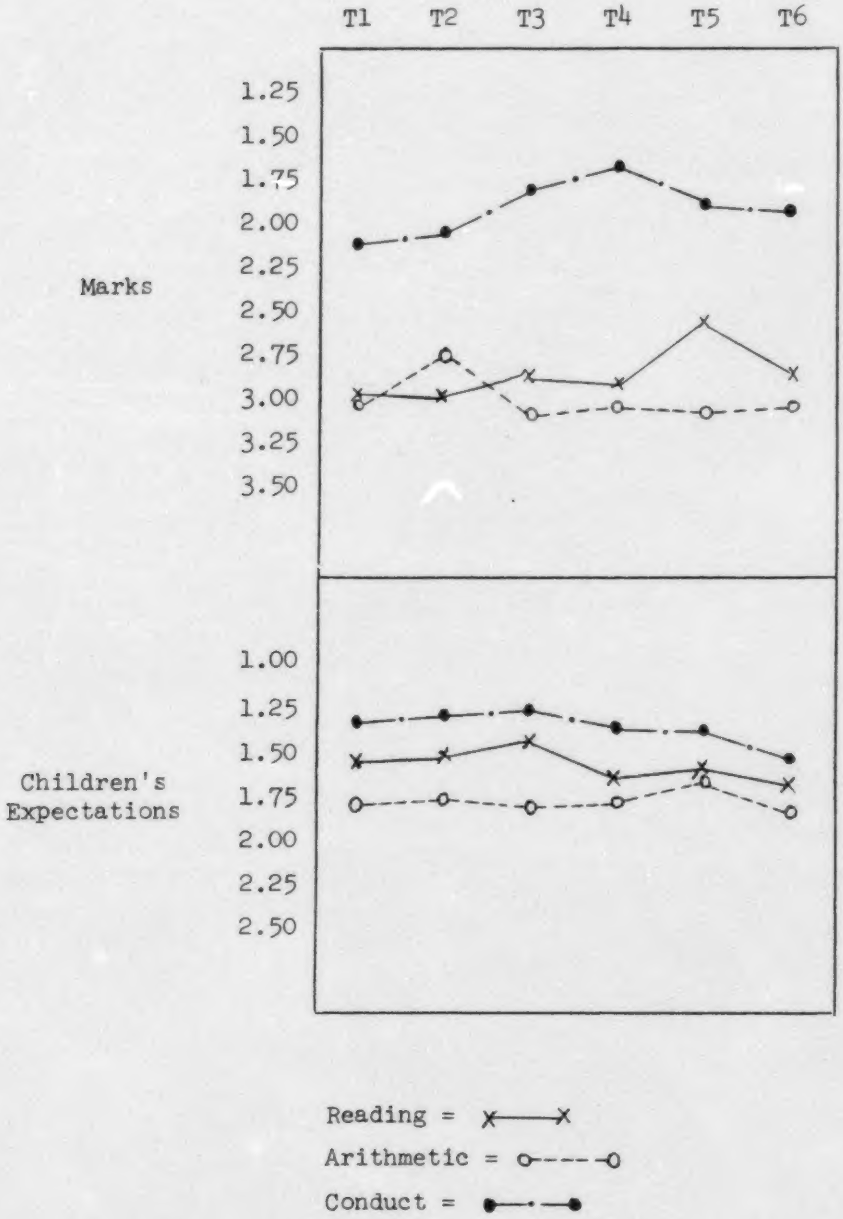
Average Marks and Children's Expectations
Over Period of Study for Integrated Lower-Class School



Reading = ✗——✗
Arithmetic = ○- - - -○
Conduct = ●—·—●

Figure 5.5

Average Marks and Children's Expectations
Over Period of Study for Black Lower-Class School



middle class expectations are more conservative at the end but have changed the least. Lower class children start with an expectation in conduct close to an A. These trends are consistent with findings that expectations of older children are lower (Parsons and Ruble, 1977; Morse, 1964) and of Rahe and Blaess (1975) that there is less overestimation of expectation from first through fifth grades.

Expectations in the middle class school are slightly below the average marks awarded, while those in the other two schools are about one full marking point too high in both reading and arithmetic. Children's expectations in the two lower class schools appear to be approaching the average marks awarded but there still is a considerable gap at the end of grade three. For example, between grades one and grade three, in reading in the integrated school the gap declines from 2.15 to 1.34 and in arithmetic from 1.30 to 0.83. Gaps between expectations and marks in the two lower class schools at the end of grade three exceed gaps noted in the middle class school, even at the start. The reason for the rapprochement between expectations and marks is not that marks have improved over the first three grades, but rather that children's expectations have become more modest.

Expectations differed little by race in the integrated school; they were almost identical at the start for the two races. Small differences (.05 to .12) favor whites at the end of third grade.

Marks. Children's first grade marks in reading, arithmetic and conduct are almost identical at midyear (somewhat over a B). All marks rise a little--from 0.15 to 0.20 grade points--between the middle and end of the year, so again at the end of the year marks in the three areas are practically identical. At the start of second grade, marks in reading and arithmetic are slightly lower than at the start of first grade--very close to a B--but conduct remains at the level noted at the end of grade one. Over second grade, marks generally rise once more, but increases vary by area. In reading there is a gain of .28 grade points while in arithmetic and conduct the gains are considerably smaller; 0.12 and 0.05, respectively. In grade three once again marks return to the initial baseline found in the earlier grades--just over a B--and then over the year all rise a little (.13 to .16). The standard deviations are relatively constant over the period--from one half to two thirds of a grade point--with the larger standard deviations being associated with conduct.

Two conclusions may be drawn. First, in each year marks in the middle-class school start from almost the same relatively high point and then rise a little. Thus the average pupil is getting good marks to start with and then improves over the year. Unless there were annual readjustments, the ceiling would soon be exceeded, so evidently each teacher in successive years must retreat to a baseline slightly above a B in all three areas. The second conclusion is that some mild distinctions among the three areas are being drawn in grades two and three, but patterns are mixed.

In the integrated lower class school, children's first marks in reading and arithmetic are about a "C", with reading slightly lower. Conduct marks are better, averaging above a B. There are improvements over the year in all three areas--over half a grade point in reading, over a quarter of a grade point in arithmetic, and a trifle in conduct. In second and third grades, the picture looks much the same at the start of the year--reading and arithmetic average close to a C, with conduct a full grade point higher. Improvements within the second and third grade years, however, are relatively larger for arithmetic--.35 for second grade and .26 for third grade. Improvements in reading are slight or nil. In second grade the gain for reading is 0.15 and there is a loss in third grade (-0.06). Conduct stays at roughly the same level throughout. Standard deviations are larger than in the middle-class school--0.68 to 1.02 units.

In first and second grade in the black lower-class school, the average marks in reading and arithmetic are close to a C throughout and there are no within-year or between-year changes of any note with the exception that first grade arithmetic marks rise about one quarter of a grade point. Average marks in conduct are close to a B in grade one, and somewhat above a B in grade two, again with no noticeable change over the year. In grade three, reading marks are somewhat higher than arithmetic marks at the start but then drop a quarter of a grade point. Arithmetic and conduct marks are constant over the year, with arithmetic marks in grade three almost identical to those in grade two. Standard deviations are about the same size as those in the lower class integrated school.

Overview. The most obvious differences among schools are that all through the first three grades, average marks in reading and arithmetic are considerably higher in the middle class school, and in this school within each grade there is a slight improvement over the year in both subjects. In the other two schools the average marks in both academic areas are lower throughout (around a C) and patterns of over-year-improvement are weaker, especially in reading. In fact, by third grade in both the lower class schools there is a decrease in average reading marks over the year. The integrated school does manifest consistent small within-year gains in arithmetic, and a relatively large gain in reading within first grade, but the initial mark in reading in this school was very low (between a C and a D).

On balance, the aggregate feedback given the average child in the middle class school is considerably more positive than that given children in the two lower class schools. The marks in reading and arithmetic are a full grade point higher, and within each year there are increases. Individual trajectories need not mimic the average, of course, but both the optimism and the constancy of the patterns in the middle school must provide encouragement. (The averages for split-half samples display substantially the same patterns.)

Racial Comparison Within Integrated School. In grade one the marks given children in reading are almost identical for both races for both marking periods. In second grade there are some small differences in reading which favor whites, but by third grade differences are negligible.

For whites, first grade marks are slightly better in arithmetic (up to .17 grade points) and also in conduct (up to .21 grade points). In fact, whites consistently exceed blacks in arithmetic in all three grades and the gap is larger in second and third grades than in first. Children of both races improve consistently in arithmetic within each year, however. For conduct, whites get better marks in every grade including the first, with a difference as large as one-third of a grade point in some instances. But, as will be seen in Chapter 6, these differences by race can be explained on the basis of other variables for with two exceptions,race itself has no significant links to performance. The overall picture for this school characterizes each race separately--that is, after a first grade improvement in reading, levels of reading marks remain constant thereafter; arithmetic is the only subject which registers consistent within-year improvements; conduct is higher than reading or arithmetic and remains so throughout the three grades.

Parents'Expectations. Parents'expectations in the middle class school are approximately the same (just above a B) for reading, arithmetic and conduct, and they do not vary by grade. Parents'expectations in the integrated and lower-class schools are also constant across grades but expectations for reading and arithmetic (midway between a B and a C) are lower than expectations of middle class parents and expectations for reading and arithmetic are lower than they are for conduct.

Parents'expectations for conduct are approximately equivalent in all three schools. Parents'expectations in the middle class school are slightly higher than children's first marks in third grade but approximately equal to their year-end marks in third grade. In the other two schools, parents'expectations, like children's expectations remain consistently higher than marks, although parents' expectations are considerably more modest than children's. Black parents in the integrated school have slightly lower expectations for arithmetic and conduct than white parents of that school but the average differences are small--.15 grade points in arithmetic,.16 grade points in conduct. Parents' expectations being closer to reality than children's is in line with previous work. Marks (1951) found the expectations of 9-to 12-year old children to be more frequently in the direction of over-estimation.

As far as homework is concerned, mothers from all three schools indicated they would help. In the middle class school about 80% of fathers were also reported to be willing to help. Fewer fathers (50% or less) in either lower class schools were reported available for homework. The number of father-absent families in both lower class schools could not be exactly determined. School records are not accurate on this topic and, for reasons of privacy, we were not permitted to query parents on this point directly. We suspect, however, that most of the negative answers to father's helping come from women whose husbands are absent from the home because of desertion or divorce.

In parent's ratings of their children's ability there were differences between schools. Despite the questions being the same for all parents--rating the child with respect to others in the same school--middle class parents see their child as considerably above average, while parents in the all-black school see "average" and in the integrated school see "slightly above average." These reports are congruent with parents' expectations for reading and arithmetic marks, for parents in the middle class school expected more than a B while parents in the other two schools expected between a C and a B. Not surprisingly, middle-class parents expect their children to come close to finishing college whereas lower class parents expect children to finish high school and perhaps attend college for a year or two.

Sampling Design

The sampling plan for this research is not easy to describe because it does not fit neatly under any of the labels commonly used. It is "longitudinal" in more than one sense of that term. To complicate matters further, data pertaining to each child have been gathered from several different respondents and sources.

This research is unusual in terms of both the length and nature of its sampling frame. Data for most micro-level school research is gathered over short periods--a few days or a week or two. By contrast, data for macro-level school research typically involves sampling at two widely separated points in time. Students, for example, in the research of Alexander and Eckland, (1975) were queried in high school and then again several years later. In contrast to these two strong traditions, our research is based on data gathered over a three-year time span (a long interval), but was obtained from many interviews during that period. Furthermore, several respondents were queried, not just students. Parents, teachers and peers were all interviewed; and in every instance interviews occured at points suitably chosen in terms of a causal frame of reference. For example, parents were asked how they expected their children to perform in the fall of first grade before teachers gave any formal evaluation. Thus if parents' expectations for children affect children's future school achievement, we have some unequivocal evidence of what those expectations were--we asked the parent what his forecast was before it could be altered by what the child actually did. We also asked for it at a time when presumably it would be most accurately stated. Later we will comment in detail on the time sequence for gathering of data and its rationale. Here, however, the point is that to understand the early schooling process and how various significant others interact with the child, a continuous monitoring of the same children is required.

Measures of different variables were procured at the different time points shown in Figure 5.1. Thus the data collection is truly longitudinal in the sense that data collection periods matched the hypothesized causal directions for effects in the model. Parents' expectations, for example, were collected in the beginning of first grade prior to children's expectations because we believe that parents' expectations are a source of children's expectations for their school performance before those children have had experience in school. Similarly peers' expectations were measured toward the latter half of the second semester of first grade because we think children could rank their classmates after some observation of their classmates' performance in the classroom but not necessarily before. We also presumed that children would be affected by their classmates' expectations, but only after enough time had elapsed so their classmates could have communicated their expectations. A fuller rationale for the time-sequencing of variables in the models is given in the next chapter.

The reader is no doubt aware that much sociological research labelled "longitudinal" is longitudinal mainly by virtue of the assumption that certain effects have occurred in the past in a particular sequence, but the actual measurement of variables representing those effects is not time-sequenced. For example, in studies of adolescent status attainment, often "educational expectations," taken as causes of "college plans," precede plans in analytic models. Both expectations and plans, however, are reported upon simultaneously by students in filling out a single questionnaire. The validity of the introjection of "longitudinal" by assumption rather than by actual timing of measurement has lately come into considerable doubt (Cook and Alexander, 1978). In any case our study is at the other extreme from most research; almost every measure is taken at a different time according to carefully worked out notions about the causal direction of effects.

The second aspect of this sample's longitudinal nature is that the same children were followed over a minimum of two semesters and a maximum of six semesters. Actually the sample is a succession of overlapping 2-wave panel designs where the majority but not all of the persons included in one panel are present in the next. No child is included for whom expectations could not be obtained for at least two consecutive semesters. A child could drop out after first grade, or enter as late as the beginning of third grade. Table 5.7 summarize entry and departure of students separately by school. In each school the within-year changes from semester to semester are noticeably lower than the between-year changes. Apparently all families, not just the suburban ones, try to gear moves to the end of the school year. Also changes in school catchment areas are made during the summer and the catchment areas for these schools were revised from time to time while the research was in progress.

The coverage provided by the sample is incomplete in that students who were in any school less than two semesters are missed. Not many were missed for other reasons. For instance, a child who was absent when expectations were measured was the target of several "call-backs." Interviewers returned to schools at least three times to interview children for

Table 5.7

Number of Students Entering and Departing from Study

	Time Interval				
	T1-T2	T2-T3	T3-T4	T4-T5	T5-T6
White Middle-Class School					
Enter	423	8	56	8	46
Depart	13	35	9	20	1
Integrated Lower-Class School					
Enter	438	33	65	22	30
Depart	22	65	24	49	17
Black Lower-Class School					
Enter	285	19	49	6	38
Depart	11	33	10	32	6

expectations, and efforts to locate parent respondents were equally intense. Only an illness that kept a child away from school for several weeks would lead to failure to obtain a measure of that child's expectations. But if previous expectations and marks were available, along with marks for the current semester, even such a chronic illness would not lead to exclusion of the child from the panel, merely to a "missing value" on that particular variable.

The major reason for exclusion of some children in the latter three years of the research was failure to obtain informed consent from parents. Pilot work for this research started in 1969 and from then until June 1973 it was necessary to secure approval from school authorities but not from individual parents for a child to be included in the research. In the schools selected for this study there were no teachers who declined to participate, and therefore all children in appropriate grades were in the sample. Occasionally a student was too shy to respond to the interviewer. In such a case the interviewer did not press the child but tried an interview at some later date. In a miniscule number of cases, probably no more than 3 in any school over the entire period of the research, a value is missing on the child's expectation variable for this reason. The child would still be part of the sample, however, because marks and the other information could be obtained.

Starting in the fall of 1974 it became necessary to obtain informed consent from every child's parent or guardian. In all schools this new requirement led to some reduction in the sample not because parents refused but because we had difficulty in reaching them and without a signature we could not include the child. In 1974-75 percentages ranged from 71% to 97% by cohort and in 1975-76 from 63% to 89%.

The population in any school is, of course, a moving target. Children are entering and leaving all during the year. A two-wave panel design for any pair of successive semesters will reflect attrition from the earlier to the later semester. This attrition is much smaller than might be thought, however, for if children entered at any time in a semester up until two or three weeks before the relevant report card was issued, they would be included. If they left, except during first grade, they would be included for all semesters up until the one in which they departed. The question of how representative the sample is then becomes the following: how different are children who are present for only a fraction of a semester (either for only the first two months of a grade or the last month of a grade) from those present for periods longer than one semester? Because of the relatively short time periods involved we do not think composition of successive cross-sections would be very different from the 2-semester panels. We did not keep a daily roster of exactly who was in the first three grades in these three schools, however. (Cook and Alexander offer evidence that parameters estimated via successive cross-sections are not very biased compared to parameters estimated with panel data where the panel duration was longer (2 years) and therefore more problematic in terms of representativeness.)

Cohorts

In order to procure samples of a size sufficient to support the analysis and at the same time to keep the data as homogeneous as possible, we studied children in three different schools and then aggregated data over several years for different cohorts in those schools (see Table 5.8).

Table 5.8

Structure of Cohorts: Maximum and Minimum N's for Children's Expectations, Parents' Expectations, or Marks

	1971-1972		1972-1973		1973-1974		1974-1975		1975-1976	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
White Middle-Class School										
Third Grade					104	82	102	96	72	42
Second Grade			103	75	92	75	64	56	88	61
First Grade	90	79	96	75	64	55	91	75	70	54
Integrated Lower-Class School										
Third Grade							115	58	105	83
Second Grade					124	108	106	53	78	65
First Grade			129	72	105	92	79	55	105	72
Black Lower-Class School										
Third Grade									90	39
Second Grade							100	27	87	36
First Grade					85	4	87	34	100	50

Research was begun in the white middle-class school in 1971, in the integrated school in 1972, and in the black school in 1973. All children in first grade in those schools were studied beginning in those years. Then, as Table 5.8 indicates, in the following year (1972 to 1974, respectively) all the children entering first grade were added to the study, while all second-graders, children followed the previous year as first-graders plus those who entered the school in second grade, were included. In 1973 to 1975, another set of first graders was picked up in each school and all children in the second and third grades were studied. By the end of the study (1975-76), in the middle-class school five cohorts of children had been picked up and followed through first grade, four cohorts were followed for two grades, and three cohorts for three grades. Likewise yearly grade cohorts for the integrated school and for the black school were picked up and followed in a similar pattern. (See Table 5.8).

In aggregating cohorts we assume that inter-cohort differences are small compared to other differences. For example, comparisons between schools based on aggregated data are blind to any differences caused by a 1971-76 duration for first-grade data collection in the middle-class school vs. a 1972-76 duration or a 1973-76 duration in the two lower-class schools. Obviously there are other differences in cohorts that we also ignore--some may be more cohesive than others for example. In addition, although there was considerable stability in the staff at all three schools, some cohorts had different teachers from others. This may be a drawback, but if cultural context as we define it--social class of neighborhood and integrated status of school--is an important influence on schooling, it must outweigh variation due to teachers or due to minor time differences.

This sampling plan has many drawbacks, at the same time we felt we had no real alternative. There are not enough students in any single school in one year to provide a large enough sample to estimate the models we wished to test. Including several schools of each type (aggregating across schools) was not a real alternative--to gather data of the type and quality we thought essential, it was necessary to work intensively with teachers, parents, and children. It was possible with a small carefully trained staff to cover three schools for three to five years (12 cohorts with at least one having a minimum life of 3 years, for a total of 27 cohort years). It was not possible either from a monetary or practical standpoint to secure data from a few students in many schools over a three year period.

We felt that, to have any hope of understanding the interplay of events and outcomes for very young children, rich data would be needed, and measurements would have to be taken as close as possible to the time when critical events occurred. The child, for instance, must be asked about how well he expects to do in reading and arithmetic before he receives his first marks in those subjects. It would be silly to think that at the end of the school year one could ask a first-grader to recall, let alone verbalize, exactly how he felt earlier about his first marks when he had been in school only two months. And it is probably wise to ask a kindergarten teacher to forecast a child's future performance in the summer, just after she has had the child in kindergarten, while her memories are still fresh and uncontaminated by (two) new classes of children. Few written records are kept in most kindergartens.

Another feature of this study deserves emphasis: the tender age of the respondents. This has many implications for data collection.

We had, as already mentioned, to secure written permission in advance from every child's parent to include the child in the later years of the study. If parents did not give permission, we had to devise procedures so that a child would not "feel left out" when we collected data. For example, if we were "playing a game" with the class to deduce peer rankings, the children whose parents had not given them permission to play were sent on an errand to the library, and the librarian kept them occupied there in order that they would not feel "left out." There is no way researchers can go into a classroom and interact with all but one or two of the small children. Furthermore, if any child, even though given parents' permission, was too shy to answer, or for any other reason balked at participating, we could not press the child; we dropped the child from that set of observations. Since all participation at every level is voluntary, an enormous amount of time was invested in public relations, answering parents' and teachers' questions and the like, and in making sure that the rights of these small children were respected.

In short, when young children are studied there has to be a tradeoff between "independent" units and validity or completeness of response. Our sample, which consists of children enrolled in three schools for several years in a row, has obvious drawbacks. It also has advantages. For research at this stage and of this type, we felt we had no real alternative. A probability sample which would require repeatedly locating a target child, his parents, his present teacher, his teacher the year before, and then carrying out several data-gathering tasks at many times in a myriad of places would be silly at this stage of the work. It would lead to enormous attrition and, we would argue, make it virtually impossible to ensure the validity of children's responses. Each child must understand clearly what he/she is being asked to do and must not feel "picked on" or "singled out" during the measurement process. Furthermore, because cooperation of both teachers and adults is voluntary and because we cannot press children for responses, selective refusals would no doubt leave us with a far-from-random sample even if we had started to procure one. Some work has actually been done in Philadelphia and Baltimore with random samples of older school children, and these samples do avoid certain kinds of dependencies among units of the sample (having children in the same class, for example). But for the reasons listed above, when very young children are studied, there has to be a trade-off between "independent" units and validity or completeness of response. (We wonder, for example, about Rosenberg and Simmons' study (1971) in which they report asking black inner city third graders questions such as: "'I feel I have a number of good qualities.' Do you agree______, Disagree_____." We would guess that few such children understand "qualities" or even the words "agree, disagree." And third graders are much advanced over first graders.) To get permission to observe or to interview as we did at various times and sites, and to carry out the tasks in the proper sequence over a five-year period, is no small undertaking. In fact, some parts of the data collection, such as playing a game with a class to get peer ratings, implies that the same clustering which has the disadvantage of lack of independence in sampling units also has the advantage that another presumably important variable can be realistically assessed.

Certainly it would have been preferable to distribute the 27 cohort-years of data equally among the 3 schools in a pattern so that each school would have 3 cohorts followed for 3 years and the total duration in each school would remain at 5 years, as below:

Year	1	2	3	4	5
3rd-Grade			1	2	3
2nd-Grade		1	2	3	
1st-Grade	1	2	3		

The feasibility of this undertaking and its funding were both reasons that the 27 cohorts are not distributed according to the more ideal plan. Partial data procured in 1971-73 in two schools were used as the basis for a proposal to support research in three schools over the latter three years (1974-76). Also, though considerable work prior to 1971 was undertaken, the procedures for securing data, and the data available from school records, varied considerably over the period of the research. Data collection was also modified by suggestions from on-going analyses. For example, for the later cohorts kindergarten teacher forecasts were procured, and parent questionnaires were lengthened. Thus usually when where incomplete information is available on measures other than expectations and marks, the reason is not "loss of respondents" but "changes in record keeping". Thus missing values in this research should not bias parameter estimates in the manner that lost subjects do.

Multiple Sources of Information

Most surveys obtain data from one respondent, and typically in studies of status attainment the student reports on his father's education and employment, and on other similar variables. The validity of this practice, it turns out, varies. Accuracy of students' reports varies with the objectivity of the information--age of parents is more reliable than reports of parents' aspirations for the child, for example. In our study the children were too young to provide written information and they could hardly be expected to furnish dependable information on their parents' or peers' expectations in any case. Consequently both parents and peers were directly questioned. Thus, disturbance terms associated with various expectation variables should be nearly independent.

The Modeling Strategy

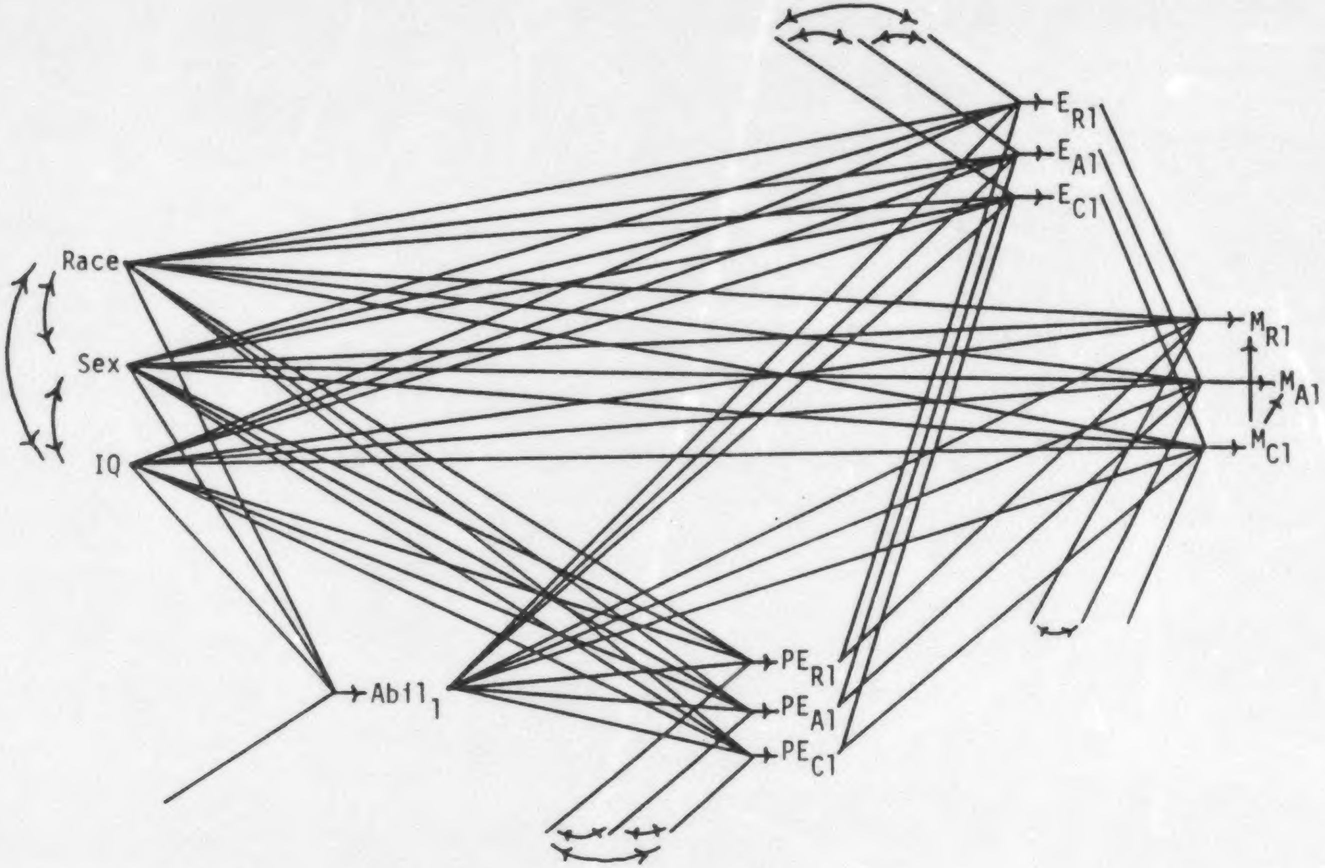
We propose two basic models (Figures 5.6 to 5.11) to represent the schooling process over a child's early school career. The first model (Figures 5.6 and 5.7) covers the first grade year. The second model is identical for grade two (Figures 5.8 and 5.9) and grade three (Figures 5.10 and 5.11) but is given separately for each of these grades to make the notation clear.

In the middle-class school, each model covers one semester.

In the other two schools there were three marking periods each year, with the first ending in late November or early December. The first model of each year for those two schools covers the first marking period and the second covers the remainder of the year.

Figure 5.6

Cycle 1, First Grade[a]

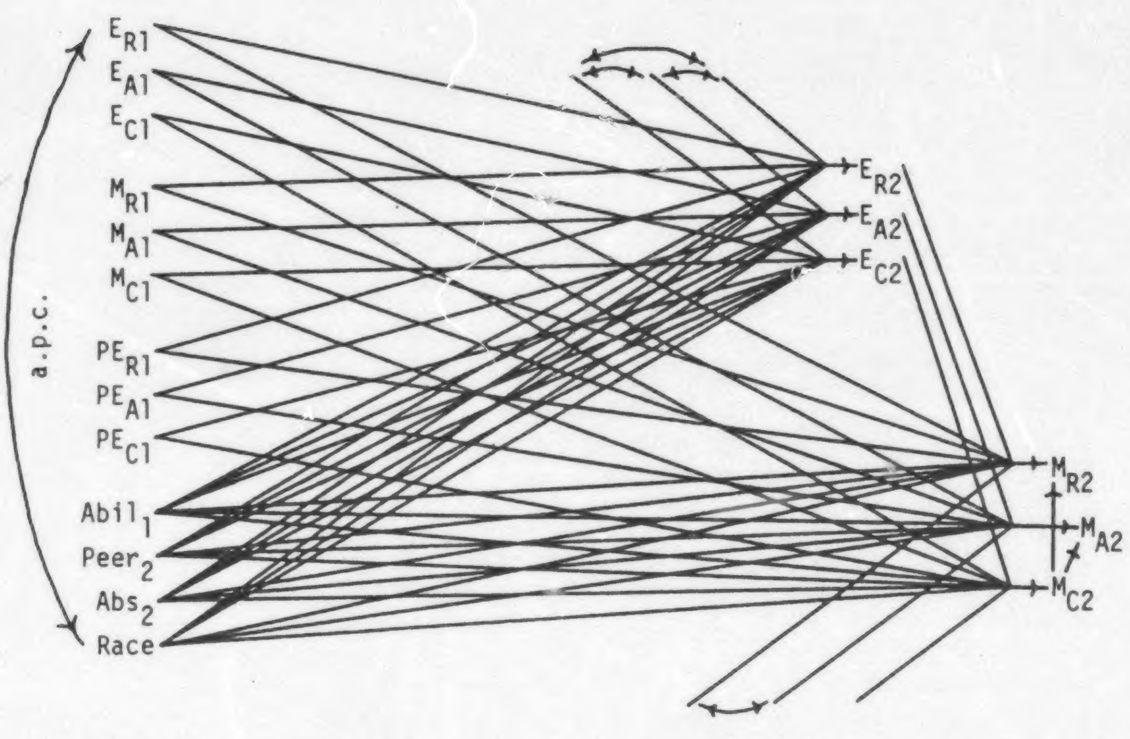


E_{R1}
E_{A1}
E_{C1}
Race
Sex
IQ
M_{R1}
M_{A1}
M_{C1}
$Abil_1$
PE_{R1}
PE_{A1}
PE_{C1}

[a] Only in the integrated lower-class school was Race included as an exogenous variable.

Figure 5.7

Cycle 2, First Grade[a]

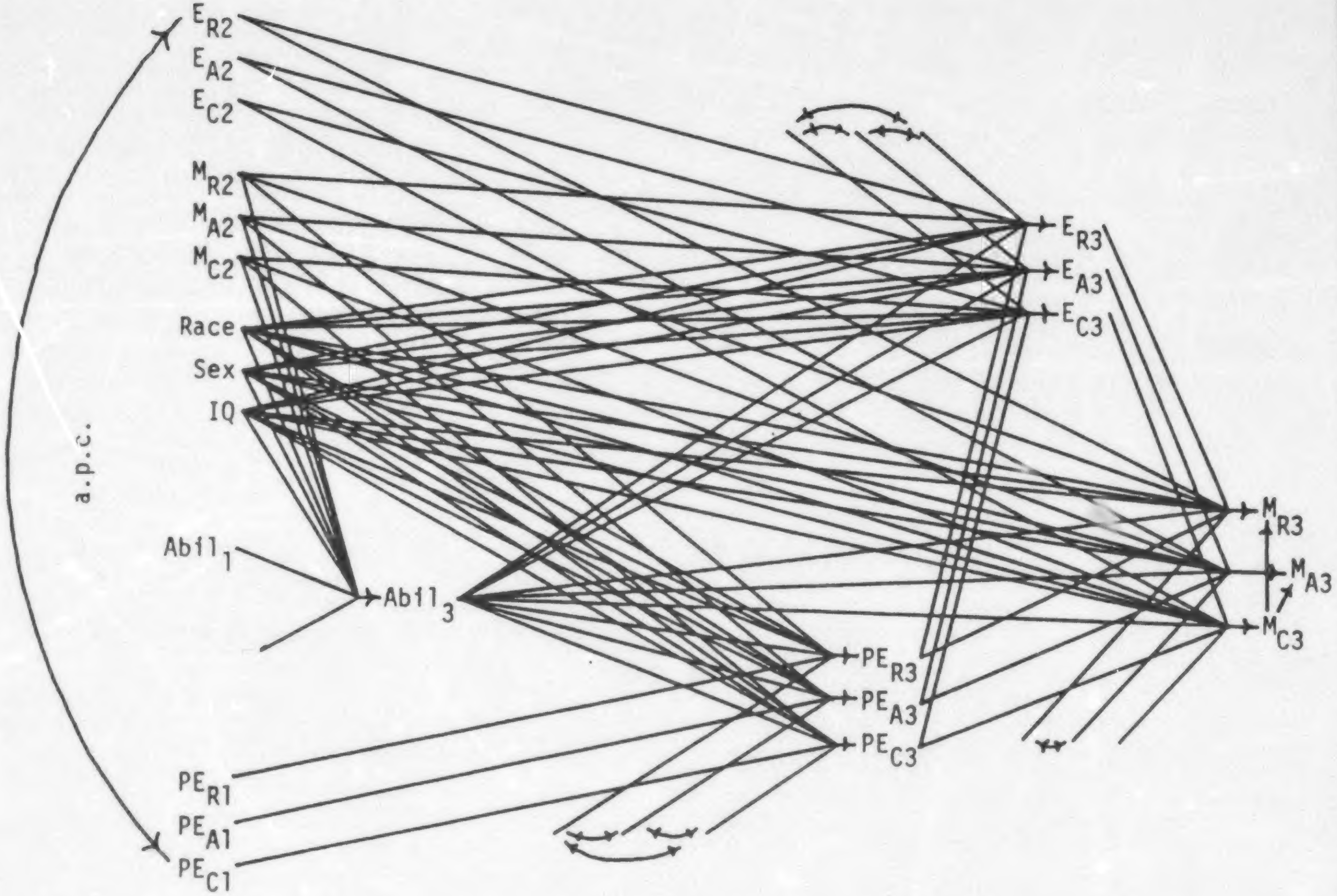


E_{R1}
E_{A1}
E_{C1}
M_{R1}
M_{A1}
M_{C1}
a.p.c.
PE_{R1}
PE_{A1}
PE_{C1}
$Abil_1$
$Peer_2$
Abs_2
Race
E_{R2}
E_{A2}
E_{C2}
M_{R2}
M_{A2}
M_{C2}

[a]Only in the integrated lower-class school was Race included as an exogenous variable.

Figure 5.8

Cycle 3, Second Grade[a]

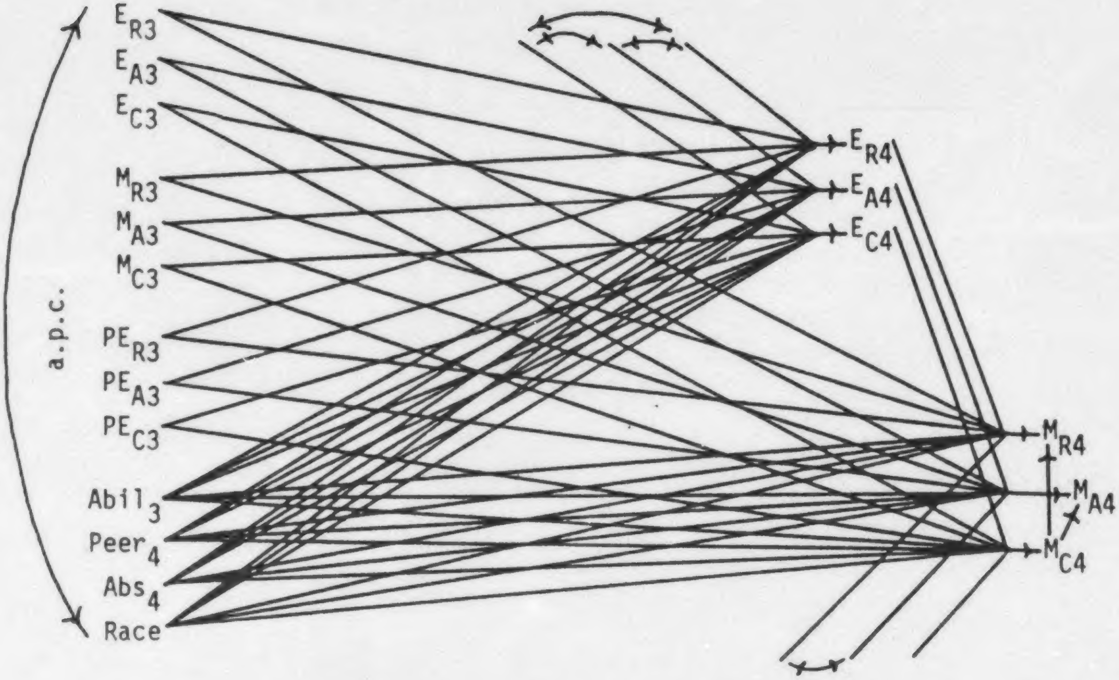


E_{R2}
E_{A2}
E_{C2}
M_{R2}
M_{A2}
M_{C2}
Race
Sex
IQ
a.p.c.
$Abil_1$
$Abil_3$
E_{R3}
E_{A3}
E_{C3}
M_{R3}
M_{A3}
M_{C3}
PE_{R3}
PE_{A3}
PE_{C3}
PE_{R1}
PE_{A1}
PE_{C1}

[a]Only in the integrated lower-class School was Race included as an exogenous variable.

Figure 5.9

Cycle 4, Second Grade[a]

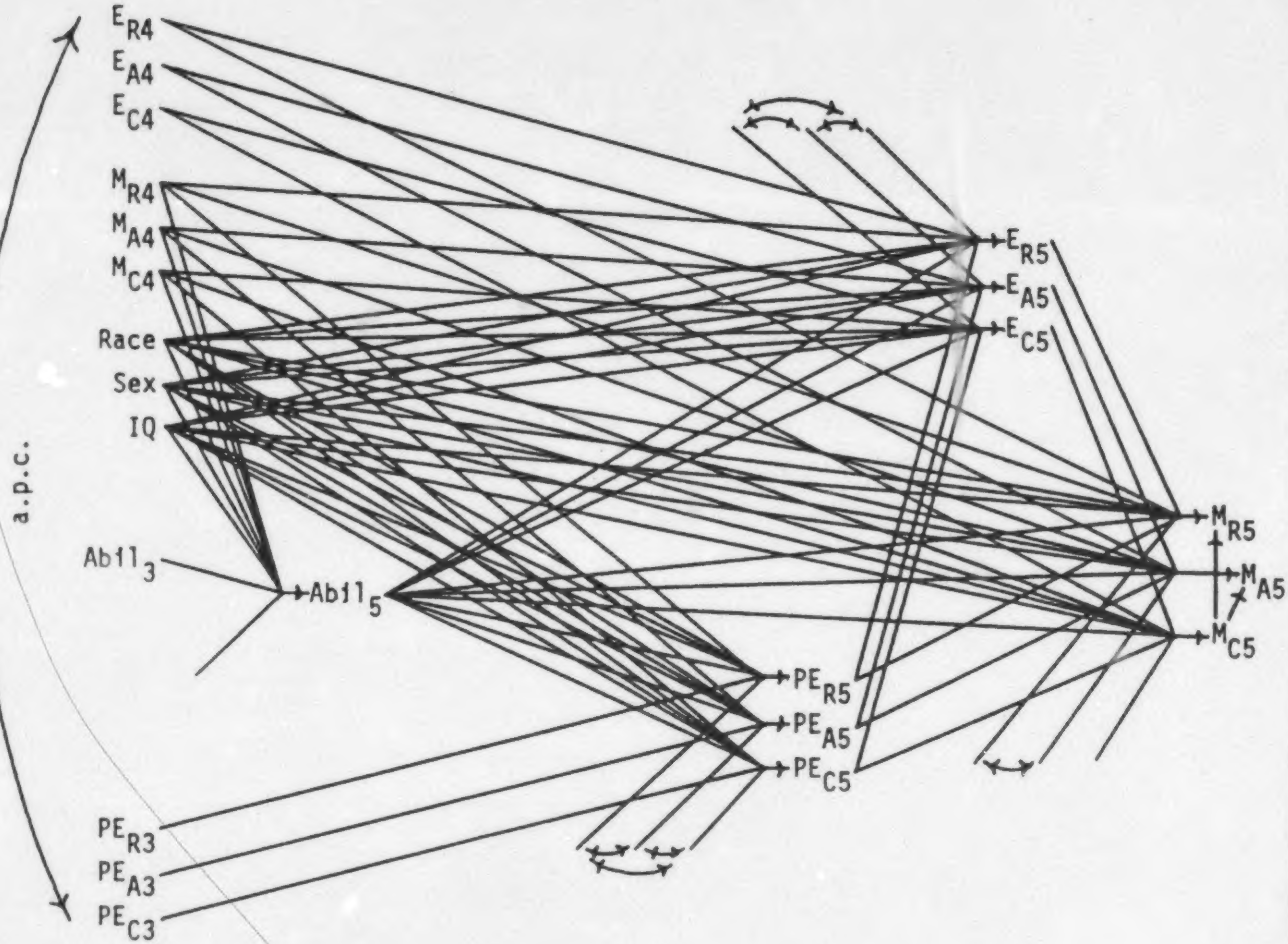


E_{R3}
E_{A3}
E_{C3}
M_{R3}
M_{A3}
M_{C3}
PE_{R3}
PE_{A3}
PE_{C3}
$Abil_3$
$Peer_4$
Abs_4
Race
a.p.c.
E_{R4}
E_{A4}
E_{C4}
M_{R4}
M_{A4}
M_{C4}

[a] Only in the integrated lower-class school was Race included as an exogenous variable.

Figure 5.10

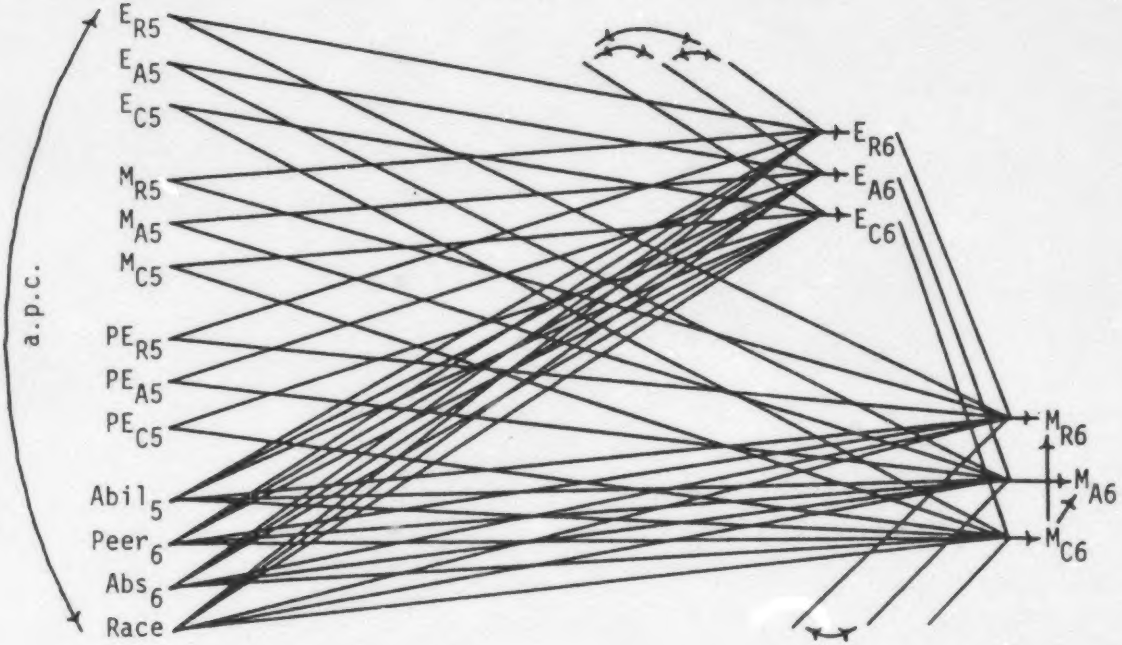
Cycle 5, Third Grade[a]


E_{R4}
E_{A4}
E_{C4}
M_{R4}
M_{A4}
M_{C4}
Race
Sex
IQ
a.p.c.
$Abil_3$
$Abil_5$
PE_{R3}
PE_{A3}
PE_{C3}
E_{R5}
E_{A5}
E_{C5}
M_{R5}
M_{A5}
M_{C5}
PE_{R5}
PE_{A5}
PE_{C5}

[a] Only in the integrated lower-class school was Race included as an exogenous variable.

Figure 5.11

Cycle 6, Third Grade[a]



a.p.c.
E R5
E A5
E C5
M R5
M A5
M C5
PE R5
PE A5
PE C5
Abil 5
Peer 6
Abs 6
Race
E R6
E A6
E C6
M R6
M A6
M C6

[a] Only in the integrated lower-class school was Race included as an exogenous variable.

Rationale for Sequence of Variables

The models are divided into two cycles per year mainly for convenience in representations. All outputs of the first cycle model in any year comprise the inputs to the second-cycle model for that same year. In first grade, for example, all the endogenous variables in the first model (Figure 5.6)--ABIL, PE_{R1}, PE_{A1}, PE_{C1}, E_{R1}, E_{A1}, E_{C1}, M_{R1}, M_{A1}, M_{C1}--are taken as predetermined variables for the second model (Figure 5.7). The placement of every variable in the models shown in Figures 5.6 and 5.7 (with four exceptions: IQ, ABIL, M_{C1}, M_{C2}) strictly corresponds with the actual point in the school year when the variable was measured. That is, the child's sex and race are ascriptive characteristics present at the start of school. Parents' expectations were measured before children's expectations and before children's marks. Children's expectations were measured before marks were issued. Peer ratings were measured in the second semester, after children had spent the better part of the school year associating with one another in class, but before obtaining either end-of-year expectations or marks.

The four exceptions to actual timing of measurements compared to their placement in the model can be explained as follows.

IQ was measured whenever the school's testing schedule decreed. Its time of measurement therefore occurred at different times for different children. Usually, however, it was measured around the middle of the second semester of first grade and remeasured in later grades. Our justification for placing it as an exogenous variable in Figure 5.6 is that a child's tested general ability to do schoolwork, which is our working definition of scores derived from IQ tests, is shaped by many factors prior to the time the child starts school. Also some related test scores, for example, those derived from reading readiness tests, were often available to teachers at or near the beginning of first grade.

$ABIL_1$, the parents' estimate of the child's ability to do schoolwork, was derived from the same parent questionnaire that was used to measure the parents' expectations for the child's performance in reading, arithmetic, and conduct. We placed it ahead of parents' expectations in the model, however, because we believe parents form general estimates of their children's "true" ability to do schoolwork before the child starts school and that these ability estimates are one source of the parents' expectations for the child's performance in specific areas like reading and arithmetic.

M_{C1} and M_{C2}, the child's conduct marks in first grade, appeared on the same report card where marks for the same marking period in reading and arithmetic also appeared. The reason for placing conduct marks ahead of the other two marks is our belief that the child's deportment in an important sense causes performance in reading and arithmetic. We see the child's general behavior as a determinant of both how much he may actually learn in these two areas--if he is talking with other children or out of his seat he is not attending to his lesson--and also of how his performance is evaluated by the teacher--the teacher may be biased in her evaluations of reading and arithmetic if the child misbehaves. Our major reason for measuring marks in conduct as well as marks in the two core academic subjects of the elementary school was to get some idea of how performance in reading and arithmetic is affected by non-cognitive factors in the early days of school. Therefore, in every model M_C appears ahead of M_R and M_A, and the child's conduct is therefore seen as one predictor of reading and arithmetic achievement. This placement will be discussed more fully later.

Rationale for Structure

For first grade, second grade, and third grade, there is one overall model per year that for convenience is divided into two figures. As already mentioned, the models for the second and third grades are identical. To distinguish between variables in the various grades the subscripts on variables indicate the proper cycle. That is, $ABIL_3$ means the third cycle, or the first part of grade two. $ABIL_5$ means the fifth cycle, or the first part of grade three. The model for first grade has the same structure in its second cycle as the fourth and sixth cycles that go with the second and third grade models, respectively, but the initial cycle for first grade is the "start-up"--it contains no inputs based on children's prior marks or expectations.

Parent Variables

We see the parent's estimate of the child's ability to do school work (ABIL) as a possible source of parent expectations (PE_{R1}, PE_{A1}, PE_{C1}) as well as a direct source of the child's initial expectations (E_{R1}, E_{A1}, E_{C1}), and initial marks (M_{R1}, M_{A1}, M_{C1}).

Parents' initial expectations would be expected to shape children's initial expectations because the parent has many opportunities to convey his expectations to the child prior to the time the child starts school. A parent who has high expectations for reading may even flatly tell the child that he "knows" the child will do well in reading.

Parent's expectations could affect the child's first marks by at least two routes. First the parent may coach his child outside school hours in reading or arithmetic, if he has low expectations because he feels the child needs extra tutoring, or if he has high expectations because he wants to make sure his expectations come true. Second , the parent may communicate his expectations rather directly to the teacher in conferences or other face-to-face meetings as well as indirectly by his reputation. Teachers in these schools in many cases know if a family is especially high status or especially low status.

ABIL is also a possible determinant of the first marks children receive because parents can determine whether or not home conditions are suitable for completing assignments. If they have a high opinion of the child's overall ability they may encourage him to engage in academic activities at home.

In addition ABIL may act as a continuing force upon the child during the entire school year, and so there are links from ABIL to both children's expectations and marks measured at the end of grade one. The parent's ABIL estimate may directly alter the child's expectation later in the year (E_{R2}, E_{A2}, E_{C2}), for example, because the child might become increasingly aware of the parent's ability assessment in carrying out first grade assignments at home. ABIL could act as a direct determinant of children's marks later in the year as well: a teacher may become better and better acquainted with a parent during the school year and so a parent's opinion could directly influence the marks the teacher gives at the end of the year. Suppose a parent, for example, who is a physician tells the teacher that he/she was surprised at an initial low mark the child received because on all measures of development to date the child has excelled relative to others his age. Such information would probably lead the teacher to rethink her evaluation if she had given the child an average mark on the first report card, and perhaps to pay closer attention to the child's performance.

The same kinds of arguments can be put forward about the immediate and more distant consequences of parents specific expectations in the three performance areas (PE_{R1}, PE_{A1}, PE_{C1}). That is, a parent's specific expectations for arithmetic could be communicated to the child before the child starts school and thereby determine the child's initial expectation. These same specific parent expectations could be communicated to the teacher and influence the first mark she gives the child in reading or arithmetic. Parents' expectations could also directly influence a mark in arithmetic given at the end of the year because, for example, after an initial low mark a parent could request a conference with the teacher in which the parent might point out that the child obviously knows a great deal about simple arithmetic because he can keep score in cribbage games, and such a conference might sway the teacher toward awarding a higher mark at the end of the year.

Children's Expectations

One of the major reasons for undertaking this research was to determine the role that young children's own expectations play in the schooling process. Already at many places in this book children's expectations have been discussed as both influences upon schooling and as outcomes of schooling. Furthermore, as made clear earlier, children's expectations are a central variable from several theoretical perspectives. Expectation states theory sees expectations as cognitive states that determine performance and at the same time as mediators affecting the way evaluations are interpreted. The research on teacher expectations (usually implicitly) assumes that teacher expectations are carriers for children's expectations. Also much research on disadvantaged or minority group children posits that their relatively low levels of achievement are a consequence of their relatively low expectations for themselves. For these and several other reasons, the models are cyclic so that expectations impinge on evaluations but then evaluations (marks) in turn impinge on expectations.

Children's initial expectations (E_{R1}, E_{A1}, E_{C1}), which were obtained before children received their first report cards, may depend on the child's race, sex, and measured IQ level. A black child, for example, may draw different conclusions from those drawn by a white child about his own ability to learn to read or do arithmetic from his experience prior to school. He may come from a home where older siblings have not done well in school, or from one where parents make their living at jobs requiring physical strength rather than reading skill and so communicate a negative message about academic work. Likewise, there is every reason to suppose that a child's sex may affect his estimates of his own likely success in reading or arithmetic or conduct. Sex role expectations for boys and girls are very different long before children start school. In addition, once school starts boys are the target of more disapproval than girls by teachers (Perry, 1975; Meyer and Thompson, 1956).

Measured IQ could affect children's expectations because IQ tests are geared to predict ability to do various kinds of schoolwork, and the child from his own experience could abstract the same kinds of information as that tapped by the test. That is, a child could be aware that he is better than other children at counting, making change, or at other tasks relating to arithmetic, or he will know he can read before he starts school if indeed he can.

The links between children's expectations and their performance are a critical feature of the model. Children's notions about their own competence, we argue, could be critical determinants of their performance, especially early in their school careers. In previous chapters we reviewed evidence from the literature suggesting that children's expectations shape specific behaviors related to learning such as hand-raising, or more general behaviors such as the amount they participate in group problem-solving sessions. Without repeating all of the contentions of expectation states theory, which was discussed in Chapter 3 in connection with several empirical studies, we note here that we accept its basic premise: a person's expectation state affects many variables, among them his actual behavior, his attitude toward his own behavior, how he is evaluated by others, and his interpretation of evaluations made by others. Therefore, we place children's expectations prior to first marks (performance) in the model shown in Figure 5.6*. We take children's initial expectations as a possible cause of the first formal evaluations they receive in school.

At this point it needs to be made clear that evaluation, as we have said above, undoubtedly affects expectations. Expressing the model as a series of time-cycled components allows precise specification of the nature of the self-fulfilling prophecy: Children are presumed to have expectations for their own performance that affect both the nature of the performance and how that performance is evaluated (marks). It is also assumed that evaluations (marks) affect later expectations. For this reason the second cycle of the model includes as part of its input marks received earlier in the year, the direct paths from M_{R1}, M_{A1}, M_{C1} to E_{R2}, E_{A2}, E_{C2}. These paths allow for feedback to affect expectations.

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*This means we are assuming children's expectations cause marks rather than the reverse. More extensive justification for this assumption appears in the next section.

Furthermore, children's expectations may persist, drift up or down as a consequence of maturation, or decay over time. These possibilities are represented by the connection between children's expectations as obtained early in first grade and as obtained again just before the end of the school year (the direct paths from E_{R1} to E_{R2}, E_{A1} to E_{A2}, E_{C1} to E_{C2}). How could such links be accounted for? First, children's expectations could persist because, having once expressed them verbally to an interested adult, the child could be made consciously aware of what his own expectations were and cling to them. Also, unless the forces determining the initial expectations changed, the child might find little reason to alter his expectations. Alternatively, children's expectations could drift up or down as they grow older. Children's self-images may actually decrease over time. (Tables 5.2 to 5.4 and Figures 5.3 to 5.5 show that children's expectations are somewhat lower in all subjects in every school at the end of grade three as compared with the beginning of grade one). Presumably expectations fall off because children obtain more and more experience and rank themselves with respect to wider and wider comparison groups. As the circle of comparison widens, the average relative expectation will likely decrease. (A child who is best in his class in first grade will find himself with a few new classmates during the year, and perhaps with many more new classmates in second and third grades. Each time the ranking is reshuffled he risks losing his top position.) Finally, the idea of complete decay of children's expectations would mean that the child effectively "started over" to form expectations between one time cycle and the next. This is not conceptually equivalent to test-retest reliability of zero, although in practice the two would be indistinguishable. (In test-retest one looks for flaws in the measurement process; in expectation decay and reformulation one addresses model structure: the determinants of expectations are just different from one time to the next.) In any case, we will posit direct paths between children's expectations early in the year and expectations later in the same year so that the direct effect of expectations at one time on those at subsequent times--their persistence--can be assessed.

In both practical and theoretical terms, the stability of children's expectations and the question of whether or not children's expectations crystallize early are important. From a theoretical standpoint, if expectations are stable starting at the time of the first measurement, one conclusion would be that home and parents rather than the school are primarily responsible for the child's ideas of his own capabilities. From a practical standpoint, if children's expectations turn out to be labile, the suggestion would be that artificial measures to raise (or lower) children's expectations might be considered with the aim of improving children's performance. Earlier (Entwisle and Hayduk, 1978) we discussed at length the likely desirability of children's expectations being somewhat on the low rather than the high side because inordinately high expectations may lead a child to ignore or deny the true level of his performance.

Children's initial expectations are seen as a cause of their first marks. There are direct paths from E_{R1}, E_{A1}, and E_{C1} to M_{R1}, M_{A1}, M_{C1}. Since the first cycle of the model connects directly to the second cycle, first marks are also seen as a determinant of children's expectations at the end of the year. One of the key elements in the models is that children's expectations respond to prior evaluations given on report cards: there are direct paths from M_{R1}, M_{A1}, and M_{C1} to E_{R2}, E_{A2}, and E_{C2}. It also seems reasonable to assume that the teacher's initial evaluations (M_{R1}, M_{A1}, M_{C1}) will influence her later evaluations (M_{R2}, M_{A2}, M_{C2}), which is equivalent to assuming that performance at one time is a good barometer of performance at some subsequent time. This assumption is embodied in direct paths from marks early in the year to marks later in the year.

Departures from Recursivity

The principal structural features remaining to be discussed are the connections from marks in conduct to marks in reading and arithmetic and other features of the models that lead them to be only partially recursive. Before discussing the partial recursivity, the assumption of one-way causation will be discussed.

There are no reciprocal paths or backward paths in any model. Although it might be thought that marks on the first report card (M_{R1}, M_{A1}, M_{C1}) could influence children's earliest expectations (E_{R1}, E_{A1}, E_{C1}) (because teachers evaluate the child in class long before the first report cards are issued), preliminary models incorporating this assumption showed that such "backward" paths had very small parameters associated with them. Two other kinds of evidence also indicate such paths are probably inappropriate.

One is the consistently small size of the partial derivatives associated with the variables E_{R1}, E_{A1}, E_{C1}, suggesting that even large changes in these parameters would not improve the fit of the model. The other is the small amount of variance in children's expectations altogether being accounted for by marks (the impact of M_{R1} on E_{R2}, for example) when the causal order is unambiguously specified. Further justification for this order is that our measurements were taken in the time frame indicated by the model--that is, initial expectations were measured before the first report cards were issued.

The departures from complete recursivity, now to be discussed, are of several varieties.

At first we explored the possibility of treating marks in all three areas in an identical manner by estimating a block recursive model with M_R, M_A, and M_C in a single block. But upon reflection we decided to place M_C ahead of M_R and M_A even though they were measured simultaneously. Until results from standardized achievement tests are available--usually near the end of third grade--the only measures available for proficiency in reading and arithmetic are the marks that teachers assign, so we had no other achievement criteria for the early grades. It hardly needs to be said that teacher's marks are fallible indicators of children's proficiency. As noted before, teachers may give higher marks to children with pleasing manners or pleasing appearances, or base their marks on many other criteria unrelated to objective standards of performance. For example, if teachers do not call upon a child often enough, if the child is shy, misses school or perhaps is often late, or even if the child happens to be placed in a class with children who are either much better or worse than he is, the assigned mark may not reflect much about the child's absolute performance level. One way to model marks in reading and arithmetic in order to reflect things other than objective performance in these subjects is to assume that these same "accidental" components are the chief determinants of the conduct mark. In evaluating the child's conduct the teacher is likely to be swayed by appearance, by attendance, and in fact, the conduct mark should reflect manners and deportment. If the conduct mark is seen as a cause of the marks in reading and arithmetic, then the portion of the reading and arithmetic marks not accounted for by conduct or measurement error can be allocated as a pure measure of proficiency. From such a point of view the reading and arithmetic marks are taken as what remains after variance attributable to measurement error and to conduct components is subtracted. All models therefore show conduct marks as determinants of marks in reading and marks in arithmetic.

A second failure in completeness occurs between cycles in any one year. Sex and IQ in any one year appear as inputs only to the first cycle. This is equivalent to assuming that sex and IQ are direct determinants of parent's ability estimates and parent's expectations, as well as of children's initial expectations and marks in any year, but that after the first cycle is complete, further effects of sex and IQ are brought about indirectly, through mediating variables. Rightly or wrongly, we take the position that sex and IQ affect initial judgments of parents, children, and teachers but that, from then on, their effects are indirect. It is hard to argue that a sex bias of parent or teacher will change over the year, or that children's responses to biases they perceive will change much within one year.

Notice, however, that at the start of second and third grades, sex and IQ appear again. This is to allow for the change of teacher that occurs when children move from first grade to second, or from second grade to third. We suspect that some teachers pay more attention than others to sex in evaluating students, or to IQ test scores. Because of a new teacher when a child changes grade, there are direct effects from these variables to ABIL, PE, and E. Children might evaluate themselves differently as a consequence of interacting with a new teacher who is more or less biased than the former teacher with respect to sex and IQ. There are, therefore, direct paths in both the second and third grades from sex and IQ to E_R, E_A, and E_C. For somewhat different reasons there are direct paths to parent variables. The parent may find out IQ test scores between the beginning of first grade and the beginning of second grade, or new test results may become available. Also parents may react to teacher's sex bias, if it was present in first grade, by lowering their expectations for a boy's reading performance or for a young boy's ability to do school work.

Similar reasoning applies to the introduction of PEER and ABS which appear as inputs only to the second cycle for each year. Each year the child's classroom has different members, children as well as teachers. And each year it takes a while for children to get to know and evaluate one another's capabilities. For this reason PEER is introduced anew in the second semester of each year. Also absence patterns may differ from year to year, and some teachers react to absences differently from others. They are re-introduced successively because we are not interested in explaining them.

Still more limitations occur in that paths from the various expectations to the various marks are area-specific: expectations in conduct affect only conduct marks, and expectations in reading and arithmetic affect only reading and arithmetic. This area-specificity is true for both parents' and children's expectations. The clustering of triplicate expectation variables and the clustering of reading and arithmetic marks, both with correlated disturbances, makes the models almost block recursive within cycles--the exception caused by placing conduct ahead of the other two marks. The reader should note carefully that children's conduct expectations do not directly affect children's reading and arithmetic marks, and the expectations for reading and arithmetic marks do not affect the conduct mark so there are some departures from the pattern.

Random Replications

No notice has yet been taken of a strategy employed without exception as these models were developed, namely all evaluations of structure based on exploration of the data were completed using data derived from cases with odd ID numbers only. Only after models were available in the form presented in Figures 5.6 to 5.11 were parameters separately estimated using the data derived from even-numbered ID cases. Thus judgment of whether or not one variable contributed significantly to explanation of any other variable, whether the ordering of variables was appropriate, or whether or not the fit of an entire (cycle) model was acceptable was first based on observation of one (random) half of the data set. All of the models in Figures 5.6 to 5.11 were decided upon before the second half of the data was explored. Parameter estimates for final models were derived by estimating parameters using the full data set, but the parameters for the even and odd divisions are also available in Chapter 6 (see Tables 6A.19 to 6A.36). The reader can judge the magnitude and direction of effects using this information.

The even-odd strategy offers a number of advantages, although obviously it carries costs as well. We will first discuss the costs, then the advantages.

The costs involve greatly increased computation expense. Starting with the basic covariance matrices, all computation had to be carried out in triplicate, once for the data based on odd-numbered cases, once for the data based on even-numbered cases, and once for the entire data set. The amount of information that needs to be weighed by the investigators is greatly increased as well.

We felt the advantages were worth the added costs for several reasons, the most important being that in exploratory work such as this there are many opportunities for the vagaries of a particular data set to influence the form of the model. We could winnow the data to our heart's content and many analyses were undertaken before we decided upon the set of models given in Figures 5.6 to 5.11. We have a clear example of how data can be misleading in the analysis of first-grade data for the middle-class school presented earlier (Entwisle and Hayduk, n.d.). In that presentation, the kindergarten teacher's forecast (a variable later eliminated) was a carrier whose significance appeared to outstrip that of several others. Its effect was in a counter-intuitive direction, however, leading us to regard it with some suspicion and to postpone judgment about its true role. As data for other schools were studied, the kindergarten teacher's forecast was much less useful so the variable was dropped. Not surprisingly, in the parallel random replicate, the parameters associated with K.T.F. were generally small and in the opposite direction from those obtained in the first replicate, clearly suggesting that the first estimates reflected a rather extreme case of sampling fluctuation.

Structural coefficients, of course, have sampling variability and there is a large likelihood that some particular coefficient will lie outside its two-standard-error boundary strictly because of the vagaries of sampling when so many coefficients are estimated. By being able to examine the consistency of a parameter, however, particularly in research such as this where sampling procedure cannot justify assumptions about random error, we hope we have been able to guard against some of the obvious pitfalls.

Exactly how to divide up a data set, particularly one where so many variables are being estimated, is not well understood (see McCarthy, 1976 and references cited therein).

If the model is a large multivariate one, repeated estimates on fractions of the data set (like jacknifing) is ruled out for many reasons, including expense. Therefore we took a simple approach. We evaluated the models using "odd" data entirely. With six cycles and three schools there is considerable redundancy to serve as a guide in trimming models. In the final analysis where estimates based on both even and odd data are available, internal consistency can serve as a further guide. We have provided the reader with full information on parameters in both replicates and for the total sample. In the discussion we pay attention mainly to patterning in the parameters rather than to absolute size.

Judging the Models

As we worked with the data and tried to understand its implications, we estimated many models never presented publicly. This cut-and-try activity is to be expected in any exploratory area of research. It is impossible to give an accurate account of the whole course of our thinking over a period encompassing several years. On the other hand, we were careful to preserve a random "new" half of the data to fit with the models we finally decided upon, and in Chapter 6 the various "fits" are presented.

The six final models we settled upon are, in our subjective judgment, the best in several respects.

(1) They are relatively simple although they take account of the major background factors almost anyone would wish to evaluate (RACE, SEX, IQ) and the major interpersonal forces known to affect school achievement (parents, peers).* They also allow expectations and marks to influence one another in a way that seems isomorphic with the life events affecting children. Furthermore, they allow for repeated feedback over time between expectations and evaluations.

(2) They are almost homogeneous in terms of the variables included over all three schools, with the obvious exception of race which applies only to the integrated school. We did not find in our exploratory analyses, for example, that in one school parents' knowledge of their children's friends seemed important while in another it was not important. The number of friends known by parents did differ from one school to another,

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*Information on sibship was collected but not used because of the need for demographic controls (see Adams, 1972).

but parents' knowledge of their children's friends did not seem to affect children's expectations or performance in any of the schools. The variables eliminated seemed unimportant in all schools, whether in terms of causal efficacy or in terms of increasing the amount of variance explained.

(3) The models are relatively simple partly because they are area-specific--parents and children are presumed to have distinct expectations in reading, arithmetic, and conduct. The clustering of the triplicate variables with correlated disturbance terms makes the models almost block-recursive, within cycles. (The exception is conduct which appears ahead of the reading-arithmetic block.) The clustering greatly reduces the number of free parameters to be estimated while at the same time acknowledging the interdependencies among the triplicate variables, modeled by the covarying disturbance terms. Between cycles we chose to input a covariance matrix which included all possible covariances among prior endogenous variables plus peer ratings and absences, thus indicating our assumption that, for example, peer ratings or absences may be affected by prior marks but we do not care to specify how. Put simply, we are not interested in explaining peer ratings or absences but in only their effects.

(4) In most cases the models, with their similar structure from year to year and from school to school, fit the data surprisingly well. Table 6.1 summarizes the likelihood-ratio X^2 goodness-of-fit for each of the three schools based on all cases, and for odd- and even-case subdivisions of the white and integrated schools.

LISREL

We used the LISREL program* to obtain FIML parameter values for all models. Since all models are characterized by one-way causation, the parameters themselves could have been obtained using least-square regression procedures. The LISREL strategy, however, offers the advantage of allowing measurement error to be directly incorporated into the structure. This is a notable advantage. Structure, as represented by parameter size, can be very sensitive to measurement assumptions, as recognized early by psychometricians (see e.g. Jöreskog, 1970) and others (Bohrnstedt and Carter, 1971; Hauser and Goldberger, 1971; Wiley, 1973).

LISREL offered other advantages as well. It turned out that so far one-way causation has proved sufficient. In exploratory work, however, (and perhaps in future work) we tried some models with reciprocal causation between expectations and marks. When paths in a backward direction turned out to have small coefficients, or sometimes when we judged from the partial derivatives pointed out by the program that such paths would be negligible in size, we felt secure in deleting them. The program thus offered a very convenient means of deciding among alternative structures.

Issues of Measurement

We use FIML procedures to estimate the structural parameters in our models. A major reason is that the available software, LISREL, permits us to incorporate information on the reliability or presumed measurement error in the variables. A shower of recent papers in the sociological literature warns of serious bias in parameter estimates when measurement error is ignored. Therefore as part of our modelling strategy we assembled as much information as possible on likely errors of measurement. That information is summarized in this section.

In estimating our time-cycled models (Figures 5.6 to 5.11) we repeatedly used coefficients linking unobserved variables to measured variables. All such coefficients will be presented in this section and then referred to later as necessary.

Table 5.9 specifies the measurement structure for the variables in our models. The tabled coefficients may be thought of as roughly the correlation between each concept and its indicator.

If correlation coefficients are the starting point of the analysis, measurement coefficients can be entered as fixed λ (lambda) values using the LISREL program. As long as a correlation matrix is analyzed, each indicator has a variance of 1.0 (i.e. $\mathrm{Var}(X)=1.0$), and since each indicator arises from a single unobserved concept and is independent of the error term, the concept and error provide additive contributions to the variance of the indicator. Fixing the lambda value and fixing the associated error variance as $(1 - \lambda^2)$ --that is, the proportion of the unit variance that is not true variance--forces the concept to have variance 1.0 (i.e. $\mathrm{Var}(\S)=1.0$). This holds because, with correlation input, the above conditions imply the following equation:

$$\mathrm{Var}(X) = 1.0 = \lambda^2 \ \mathrm{Var}(\S) + (1 - \lambda^2)$$

Such a procedure implies the variances of both the concepts and indicators are 1.0 (the indicators have variance 1.0 from the input correlation matrix and the concepts are forced to have a variance of 1.0 as shown just above) but the metric relating the concept to our indicator

Table 5. 9

Measurement Coefficients (λ_x and λ_y)

	Children's Marks As Marks			Children's Marks As Performance Indicators			Children's Expectations				Parent Variables									
	Reading	Arithmetic	Conduct	Reading	Arithmetic	Conduct	Reading	Arithmetic	Conduct	Replicate Arithmetic	Reading Expectation	Arithmetic Expectation	Conduct Expectation	Ability Estimate	Peer Popularity Rating	Absences	Lateness	IQ	Sex	Race
White Middle-Class School																				
Grade 1	.95	.95	.95	.60	.60	--	.90	.90	.90	.75	.90	.90	.90	.95	.85	.95	.90	.87	1.0	X
Grade 2	.95	.95	.95	.60	.60	--	.95	.95	.95	.85	.95	.95	.95	.95	.85	.95	.90	.87	1.0	X
Grade 3	.95	.95	.95	.60	.60	--	.95	.95	.95	.85	.95	.95	.95	.95	.85	.95	.90	.87	1.0	X
Integrated Lower-Class School																				
Grade 1	.90	.95	.95	.80	.75	--	.70	.70	.70	.55	.90	.90	.90	.90	.80	.90	.90	.87	1.0	1.0
Grade 2	.90	.95	.95	.80	.75	--	.80	.80	.80	.65	.95	.95	.95	.90	.80	.90	.90	.87	1.0	1.0
Grade 3	.90	.95	.95	.85	.80	--	.90	.90	.90	.80	.95	.95	.95	.90	.80	.90	.90	.87	1.0	1.0
Black Lower-Class School																				
Grade 1	.90	.95	.95	.50	.70	--	.70	.70	.70	.55	.90	.90	.90	.90	.80	.90	.90	.87	1.0	X
Grade 2	.90	.95	.95	.75	.60	--	.80	.80	.80	.65	.95	.95	.95	.90	.80	.90	.90	.87	1.0	X
Grade 3	.90	.95	.95	.80	.60	--	.90	.90	.90	.75	.95	.95	.95	.90	.80	.90	.90	.87	1.0	X
Relevant Notes:	1	1	1	2	2	3	2	2	2	2	2	2	2	4	5	6	7	8	9	9

[1] The only errors influencing these variables are recording or keypunching errors which are small in magnitude and uniform across schools. First-grade reading marks receive a lower coefficient because some of the cohorts received marks based on reading book level (which we converted into a 1 to 4 scale) which may have been confusing to both students and parents.

[2] These coefficients are discussed in the body of the text.

(Notes continue on next page.)

Table 5. 9 (Continued)

Table Notes Continued:

[3] Conduct marks are never used as indicators of standardized conduct performance.

[4] The clarity of the questions and answer categories provide the high values while the school differences arise from the greater contact the middle-class parents have with the school. The wording of the answer categories minimized social desirability concerns.

[5] A test-retest measurement of the most frequently used procedure for measuring peer popularity provided a correlation of .72. In two classes the game for obtaining popularity ratings was played twice, one week apart. In one class the rank-order correlation was .68, and in the other it was .76. While this is reliability information, this also closely reflects our estimate of the validity of this item. Approximately the square root of this, or .85, appears as the coefficient for the middle-class school, while .8 is used for the other school to reflect the slightly increased difficulty of gathering this information in these schools.

[6] Only recording and keypunching errors influence the middle-class school estimates while the frequent possibility of confusing substantial lateness with absence reduces the coefficients in the other schools.

[7] The infrequency of lateness in the middle-class school encouraged some laxity in keeping these records. In the lower-class schools there was more lateness but the care and consistency with which these records were kept is still questionable.

[8] The tabled coefficient of .87 is the square root of .75 which was our estimate of the reliability of our IQ measures. The IQ tests used were:

Test	Grade Level	Cohorts Receiving Test	No. of Cases Receiving This Test	Published Reliabilities
Primary Mental Abilities (PMA)	Kindergarten	3	297	--
	First Grade	4	367	.83
Primary Cognitive Abilities Test (PCAT)	Kindergarten	4	275	.774
	First Grade	4	338	.788
	Second Grade	3	241	.814
Cognitive Abilities Test (CAT)	Third Grade	5	410	.93+
Short Form Test of Academic Aptitute (SFTAA)	Second Grade	1	102	

The reliabilities for the Primary Cognitive Abilities Test are test-retest correlations with a 13-month interval as reported by Thorndike, Hagen, and Lorge (1974). The Cognitive Abilities Test value indicates all three sections of this test had Kuder-Richardson 20 reliabilities in excess of .93 as reported by Thorndike and Hagen (1971). In first grade the PMA test had a test-retest reliability of .83 with both a 1 and a 4 week interval (Thurstone and Thurstone, 1965). While no kindergarten values are available we assume they would be slightly lower than this.

The SFTAA test in grade two has published reliabilities of .93 for a two-week interval and .75 for a 14-month interval (Sullivan, Clark, and Tiegs, 1974).

Three types of information condition our acceptance of these published values. First, individually administered tests typically provide slightly better reliabilities. For example, Honzik, MacFarlane, and Allen (1948) provide values of .82 and .83 for children tested and retested at the ages of 6 and 7, 7 and 8, respectively. Second, scores on different IQ tests are less consistent than test-retest reliabilities. Harcourt, Brace, and World Test Department (1961, 1968) reports correlations ranging from .53 to .80 for the application of several different tests to children in the first three grades, while Hieronymus and Stroud (1969) report fourth-grade inter-test correlations ranging from .50 to .83. And third, actual developmental changes in IQ which produce differing rankings of individuals are occurring at this stage of the life cycle. Bloom (1964), for example, reports that even perfectly measured IQ's measured at the ages of 5 and 17 correlate about .8 while those measured at 8 and 17 correlate about .9--with these values not reaching 1.0 due to real developmental changes. The tabled value of .87 is the same for all schools. Any poorer testing in the lower-class schools would be offset by the fact the low IQ's are more reliably measured than higher IQ's (Robert Gordon, personal communication).

is not 1.0. That is, the concept and indicator have different units of measurement, as represented by λ.

Analyzing correlation matrices, however, leads to standardized parameters and raises the well known concern that differences among the variances of the variables in different populations is confounded with the magnitudes of the effect parameters. If comparisons between populations are made, unstandardized coefficients are preferable. We eventually wish to compare parameters for three different schools, or between three grades within any single school, so we want structural coefficients obtained from covariance analyses rather than standardized coefficients obtained from correlation analyses.

When running covariance analyses, we fixed the λ coefficients in LISREL equal to 1.0 to provide our concepts with the same units of measurement as our indicators. Fixing the error variances at " 1 minus the square of the tabled λ value, times the variance of the indicator"--that is as $(1 - \lambda_T{}^2)$Var (X)--provides the correct proportion of true and error variances in our indicators. Besides scaling the concept and indicator to have the same scale of measurement, and appropriately partitioning the variance of the indicator, these constraints set the variance of the concept equal to the true or systemic portion of the variance in the indicator.

In practice, we fixed both the concepts' variances and error variances at the appropriate values if the variable was exogenous. For endogenous variables the error variances and measurement were "fixed" as indicated, but the LISREL program was free to modify the variance of the concept (Var(N)) if this was required. Since any such change in variance made a direct increase in the χ^2 fit for the model, such "program" emendations to our measurement structure were minimal. While somewhat less than desireable, there was no alternative available within LISREL to directly fix the variance of the endogenous concepts.

The Influence of Measurement Structure on Covariances

The procedure used in running covariance models was that the covariance matrix for the exogenous concepts (Phi coefficient) was entered as a fixed matrix, which makes estimation of the numerous coefficients in this matrix unnecessary. (There actually was no other alternative for the second semester models since the Phi matrices for these models contain far too many parameters for LISREL to handle.) The measurement procedure discussed above concludes that the variance of the true concept (ξ) is expressed as the proportion of the variance of the indicator (X) that was true variance. That is Var (ξ) = λ^2 Var (X) where λ is the appropriate coefficient from Table 5.15. The remaining proportion of the variance in the indicator, $(1 - \lambda^2)$ Var(X), is error variance. Thus we have already discussed the portion of the Phi matrix that concerns the variances of the concepts.

The covariances among the unobserved concepts will not be discussed. If we had needed the correlations between pairs of unobserved concepts, each with unit variance, we could have obtained them using the usual formula for correcting a correlation for attenuation:

$$r^{*}_{xy} = \frac{r_{xy}}{(r_{xx}\ r_{yy})^{1/2}}$$

Under these conditions, our tabled lambdas imply:

$$r^{*}_{xy} = \frac{r_{xy}}{(\lambda^2_x\ \lambda^2_y)^{1/2}} = \frac{r_{xy}}{\lambda_x\ \lambda_y}$$

Thus the actual correlation between two concepts is larger than the observed correlation and depends on how far λ_x and λ_y fall short of the perfect value of 1.0.

To obtain the covariance between two concepts we multiply the correlation r^*_{xy} by the standard deviations of the concept thereby using the definitional relation between correlation and covariance.*

Since the variance of any concept was λ^2 times the variance of the indicator, the standard deviation of the concept is the appropriate λ times the standard deviation of the indicator (i.e., the square root of this). This provides:

$$\mathrm{Cov}^*_{\S_1\S_2} = r^*_{\S_1\S_2}\ (\lambda_1\ \mathrm{SD}(X_1))\ (\lambda_2\ \mathrm{SD}(X_2))$$

$$= \frac{r_{x_1x_2}}{\lambda_1\lambda_2}\ (\lambda_1\ \mathrm{SD}(X_1))\ (\lambda_2\ \mathrm{SD}(X_2))$$

$$= r_{x_1x_2}\ (\mathrm{SD}(X_1))\ (\mathrm{SD}(X_2))$$

$$= \mathrm{Cov}_{x_1x_2}$$

This demonstrates that decrementing the concept variances to make them equal to the true portion of the indicator variances implies the observed covariances are precisely those covariances that would appear if we were to correct the concepts' "correlation" for attenuation and

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$$^*\mathrm{Corr}_{xy} = \frac{\mathrm{Covariance}}{(\mathrm{Var}(X)\,\mathrm{Var}(Y))^{1/2}}$$

then provide the concepts with the proper variances. That is, while traditional procedures for dealing with measurement error require that the variance of the observed and conceptual variables are held constant at 1.0 and the covariances adjusted upward, we can accomplish precisely the same thing by reducing the variances (making the variances of the concepts equal to the true portion of the variance of the indicator) and holding the covariances constant. A way to visualize why the covariance terms are not reduced by the introduction of measurement assumptions is to note that only the true covariances contribute to observed covariances once one assumes independence of measurement errors, and hence both the true and observed covariances should be the same.

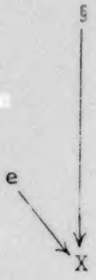
In other words, these constraints indicate the following equation holds:

$$\mathrm{Var}(X) = 1^2\ \mathrm{Var}(\S) + (1 - \lambda_T^{\,2})\mathrm{Var}(X)$$

and this in turn implies $\mathrm{Var}(\S) = \lambda_T^{\,2}\ \mathrm{Var}(X)$.

Diagrammatically, the correlation and covariance systems of analyses might be illustrated as:

Correlation Analysis

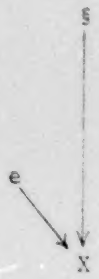


$\mathrm{Var}(\S) = 1.0$

$\mathrm{Var}(\mathrm{error}) = (1 - \lambda^2)$

$\mathrm{Var}(X) = 1.0$

Covariance Analysis



$\mathrm{Var}(\S) = \lambda_T^{\,2}\ \mathrm{Var}(X)$

$\mathrm{Var}(\mathrm{error}) = (1 - \lambda_T^{\,2})\mathrm{Var}(X)$

$\mathrm{Var}(X) = \mathrm{Var}(X)$

The following discussion concerns measurement parameters (λ's) in the sense of correlation analyses because in this form the λ's are easily interpretable as either the correlation between the values of the true concept and the indicator, or as the square root of the test-retest reliability of the measure. Our primary use of these parameters will be to determine $(1 - \lambda_T^2)$ which is the proportion of error variance in our indicator. When multiplied by the variance of the corresponding indicator this provides the actual error variance which we specify as "fixed" in conducting covariance analyses.

Measurement Assumptions

In Table 5.9 the measurement coefficients are allowed to vary by school and by grade. In general, the measurement procedures were best in the white middle-class school but less precise (and usually assumed equal) in the integrated and black lower-class schools. This reflects many concerns including the greater hesitance of lower-class children to talk to adults, the relative difficulty of locating both lower-class parents and children (more absences and lateness), greater difficulty in gathering data as scheduled, a more confusing multipicity of marking schemes in these schools.

The coefficients generally increase as grade level increases indicating data for third grade children are rated as generally better than for first grade children. By third grade the students are more familiar with the different academic areas (they can easily separate reading from spelling, for example); they are more familiar with the use of report cards and the associated marking schemes; they were less hesitant about talking with the researchers who initially appeared as strangers but who later were perceived as familiar; and both children and parents were more familiar with the interview procedures, having completed the measurement instruments on several previous occasions.

These tabled values were selected prior to our having "tried them out" on any models so there was no possibility of their being selectively chosen to support our models and conclusions. In fact, making these coefficients either consistently too large or too small incurs costs, so we tried to estimate the coefficients as accurately as possible.

The lengthy series of notes appended to Table 5.9 provide some of the easily-communicated considerations pertaining to the coefficients for particular variables. Many of the minor decisions, requiring a choice between .85 or .9, for example, rested on both our discretion and our familiarity with the overall data set, as well as the behavior of these variables during prior analyses. Initial attempts of using extremely conservative measurement coefficients introduced estimation problems that required expensive and adhoc revisions, so artifically low coefficients were avoided.

In what follows we will consider in detail the measurement coefficients for children's and parents' expectations and for children's marks because these concepts lie at the core of our concerns.

The Measurement of Children's Expectations

Several types of information bear on how accurately we have been able to measure children's expectations. The first concerns how well children understand what it is they are being asked to rate when they give their expectations. That is, if children do not understand what a report card is and what it signifies, the remainder of the task is meaningless. Accordingly, in June 1973 all first-grade children from both the integrated and white schools were individually interviewed and asked to explain what a report card was and what each of the marks issued by their school meant. This questioning did not inquire about expectations.

All children in both schools were able to explain that a report card was the teacher's written evaluation of that child's performance. Thirty-five percent of the 77 integrated lower-class children verbalized the basics of the letter marks issued in reading and arithmetic, and 42 percent of these children expressed the ranking implied by the numerical grades issued in conduct. Eighty-one percent of the 95 children interviewed in the white middle-class school correctly verbalized the the numerical marking system used in all marking areas in this school. Thus using a stringent criterion--whether the children on a separate occasion could correctly state to an interviewer both what report cards signified and what all the evaluations on report cards signified--a high percentage of the children understood the basic concepts they would have to employ in carrying out the expectation--verbalizing procedure correctly. Receiving report cards earlier in the year (and the fact that three kindergarten report cards were issued to children in the integrated school) helped children understand report cards. The sharp difference between the number of students in the integrated lower-class and middle-class schools (35% vs. 80%) who correctly verbalized the essence of the marking schemes implies that measurement coefficients should differ between schools in the first grade. On the other hand we are convinced that the actual magnitudes of the coefficients should not reflect such large differences between schools, because requiring that lower class children verbalize information underrates their competence. It is well-known that lower class children will not converse readily with strangers (particularly if the strangers are middle-class), and that dialect-speaking children often react with silence or "non-work" responses when addressed by a non-dialect speaker.

A second kind of information bearing on how well children's expectations were measured came from a test-retest reliability study of all three grades in all schools in June 1977. Children's expectations were first obtained via the usual procedures at the end of the year and then the children were re-interviewed after a period of one to two weeks. Besides reassessing the children's prevailing expectations the reinterview also probed to see if the children recalled the expectations they had given earlier. The replicate observation had to be scheduled in the brief time span between the initial expectation gathering and the issuance of report cards. Naturally the actual interviews were shielded from classroom scheduling pressures as much as possible but to whatever extent the replicate expectations were not measured as well as we would hope, correlating them with even a perfect earlier measurement would reduce test-retest correlations. Table 5.10 presents the correlations between the children's initial, retested, and recalled expectations.

If considered alone, the first three columns of Table 5.10 suggest second and third grade expectations are moderately stable over the test re-test period but that the arithmetic expectations of the integrated school, and reading expectations of both lower-class schools, are measured very poorly. Considering recalled expectations (the second

Table 5.10 Correlations for Children's Retested Expectations[1]

	Initial with Retested Expectations			Initial with Recalled Expectations			Recalled with Retested Expectations			Year-end Arithmetic Expectations with Arithmetic Expectations Derived from the second term Self-esteem Tests		
	Gr.1	Gr.2	Gr.3	Gr.1	Gr.2	Gr.3	Gr.1	Gr.2	Gr.3	Gr.1	Gr.2	Gr.3
White Middle-Class School												
Reading	.35 (22)	.36* (26)	.46*** (30)	.90*** (19)	.43* (23)	.93*** (29)	.47* (19)	.54** (23)	.59*** (29)			
Arithmetic	.52** (22)	.82*** (26)	.79*** (30)	.55* (17)	.86*** (23)	.91*** (30)	.89*** (17)	.87*** (23)	.73*** (30)	.25*** (362)	.42*** (317)	.55*** (241)
Conduct	.64*** (22)	.52** (26)	.06 (30)	.89*** (17)	.68*** (24)	.55*** (28)	.55* (17)	.73*** (24)	.44** (28)			
Integrated Lower-Class School												
Reading	-.13 (27)	.38* (32)	.76*** (26)	.24 (27)	.46** (31)	.58*** (26)	.22 (27)	.43** (31)	.73*** (26)			
Arithmetic	-.31 (27)	.41** (32)	.82** (26)	.00 (26)	.54*** (32)	.53** (26)	.36* (26)	.58*** (32)	.67*** (26)	.12* (296)	.15* (205)	.40*** (143)
Conduct	.56*** (27)	.61*** (32)	.50** (26)	.38* (25)	.60*** (32)	.77*** (25)	.40* (25)	.68*** (32)	.53** (25)			
Black Lower-Class School												
Reading	.01 (22)	.58*** (25)	.58*** (60)	-.04 (21)	.63*** (24)	.65*** (59)	.58** (21)	.38* (24)	.64*** (59)			
Arithmetic	.41* (22)	.06 (25)	.57*** (60)	.46* (20)	.75*** (23)	.69*** (57)	.84*** (20)	.05 (23)	.56*** (57)	.03 (172)	.31*** (122)	.51*** (128)
Conduct	.73*** (22)	.82*** (25)	.47*** (60)	.58** (21)	.62*** (25)	.41*** (58)	.79*** (21)	.34* (25)	.50*** (58)			

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[1] N's appear in parentheses, and grade level is indicated as Gr.1, Gr.2, Gr.3.

*one-tailed $p < .05$

**one-tailed $p < .01$

***one-tailed $p < .001$

set of three columns) we find increases in a majority of the coefficients; this suggests that though the children could recall what they had said previously, they sometimes chose to provide other responses. Evidently some real changes in expectations occurred, as might be expected given the substantial intervening time interval (about 5% of the year). Only two first-grade measures remain particularly troublesome according to these data--reading in the black school and arithmetic in the integrated school. We present more information regarding arithmetic below. Reading was assigned the same coefficient as the other areas since the measurement procedure was identical across areas.

Of the 270 children providing expectations at both times 16 percent volunteered their recollection of the earlier proceedings, while 80 percent indicated that they recalled the earlier interview when asked directly, and only one child failed to recall the earlier interview even with substantial prompting. More children, however, failed to recall specific expectations they had voiced on the prior occasion. For reading, arithmetic, and conduct, the percentages of children who recalled the prior interview and who also and offering particular recalled expectations are 96, 94, and 94 percent, respectively. Table 5.10 indicates the accuracy of this recall was higher for the higher grades.

A very fortunate coincidence provides us with additional information concerning the measurement of arithmetic expectations in all three schools. A self-esteem questionnaire was completed by all children during the latter part of the second term of each grade. (Because earlier analyses cast doubt in the construct validity of this measure self-esteem scores were not included as predictors in the final version of our models).

In this test the children indicated how good they thought they were at various activities such as running, playing ball, being polite, et cetera. One of the items on both the boys' and girls' forms of this questionnaire asked about arithmetic--so the children were indicating how good they thought they were at doing arithmetic, but marking response categories of "very good", "good", "not good or bad", "bad", and "very bad" in arithmetic.

Combining the last two categories, which were used the least frequently, gives a measure of arithmetic expectations independent of the measure obtained using the standard procedure. The timing of the collection of these additional data, however, did not correspond precisely with the actual collection of expectations. Self-esteem, and hence these additional arithmetic expectations, were normally collected about two to five weeks prior to report card issuance but always ahead of specific expectations (collected about one to three weeks prior to report cards.) This implies some time was available for real changes in expectations between this and year-end expectation recordings.

This recoding of expectations also differs in that the context of the children's responses was quite different. The usual procedure couched the expectation questions in an academic context of report cards and marking schemes, while the question as posed in the self-esteem questionnaire was not focussed on a particular upcoming report card, and was generally surrounded by a range of questions reflecting many different activities: skating, helping others, being the proper weight and so on.

Thus, the time span, the non-academic frame of reference, and the administration procedures may have all contributed to these measures being less than ideal replicate measures. In this light we were not surprised with the modest correlations appearing in the last three columns of Table 5.10 reporting the correlations between these arithmetic "expectations" and those gathered at the respective year-ends by the standard procedure.

The product of the pairs of measurement coefficients for the true and esteem-replicate arithmetic expectations in Table 5.9 provide predicted correlations about .3 units larger than these tabled values (a difference reasonably attributable to real changes in expectations) which much more closely approximate those for the test-retest procedure reported above.

Fortunately, there are several places where this extra set of arithmetic data nicely complement that discussed above for the short-term replication. Both the largest negative value (Integrated school, first grade) and a nearly zero value (Black school, second grade) are now demonstrated to be unquestionably too low. Also, the smallest value from the self-esteem replications (Black school, first grade) corresponds to a substantial value in the short term replication. Together they provide a convincing demonstration that while our measures are not perfect they do tap the dimensions they were designed to reflect.

All things considered, we conclude that first-grade children's expectations are measured with considerable reliability in the middle-class school and probably with somewhat less reliability in the other schools. The precision of expectation measurement definitely improves for children in higher grades in all three schools.

The Measurement of Parental Expectations

We do not have test-retest data for parental expectations, but several points should be made.

Perhaps the strongest argument for precision in measurement center on how the expectations were obtained. By having the parents fill out a replica of the school's report card which contained the titles and brief descriptions of how performance is rated in reading, arithmetic and conduct, and having interviewers explain whatever was unclear, the parents' task was extremely well defined and precisely focused.

Parents gave expectations each year in the fall. The first interview may have been the most problematic since in addition to this being the parent's first encounter with the interviewer, there were no obvious benchmarks for the parents to base their expectations on--their first expectations were recorded prior to any formal feedback in the form of marks from the schools. By the time of the second and third grades interviews, the parents had "evidence" drawn from the child's previous report cards and teacher's comments.

Conduct expectations may, in general, be slightly less stable than reading or arithmetic because of the inherent fluidity of conduct. A month of good behavior can be overshadowed by one bad incident, and most children's conduct is influenced by other students. If surrounded by well-behaved youngsters, a child is much more likely to display acceptable conduct. The inherent uncertainty associated with conduct as a "performance" obtains no matter what grade level is considered but is offset by the fact that conduct is an aspect of behavior for which parents receive the most direct supplementary evidence.

While one might think that parents would voice only the highest expectations for their children, Tables 5.2 to 5.4 indicate a majority of parents expressed only moderately optimistic expectations, suggesting their answers had some validity.

Overall we believe parental expectations were equally well-formed in all the schools but that in first grade expectations are slightly harder to measure. The coefficients in Table 5.9 indicate that about 81 percent of the variance in parents' initial reading and arithmetic expectations is considered true variance while about 90 percent of the variance in their expectations in the later grades is considered true.

The Measurement of Children's Marks

There are two distinct ways of considering marks that imply very different degrees of precision in our use of report card marks as indicators. If we are interested in marks as marks, that is, if we attempt to explain the actual marks children receive on their report cards and the impact of report card evaluations on other factors such as expectations, our transcription of report card marks from school records provides almost error-free measurement. The only error component would arise from coding or keypunching errors strictly minimized to less than 1%. Even teacher errors, such as recording a mark in a wrong row, do not necessarily contribute error variance because the consequences of such a mark are real, even if unintended. In the two lower-class schools, reading marks were frequently reported as the level of the reader the child was working in. Since this necessitated recoding to our 1 to 4 marking schema, additional errors may have been introduced here, so slightly lower coefficients appear in Table 5.9. Again, however, the error component is small.

Using report card marks as indicators of the children's performance capabilities is a horse of another color. How well children actually read and write--issues we must address because they relate to class and racial achievement differences--are less well indicated by report card marks. Motivational components of marks, in this definition, are of less interest. Performance indicators report what the children can actually do, without regard for what will make them do better in the future or for rewarding past improvements. In fact, the middle-class school's policy of marking children in terms of effort specifically directs the teachers to attempt to partial out that component of marks reflecting performance capabilities, and from our perspective it is fortunate teachers were rather unsuccessful in implementing this objective.

We gathered all the available data on standardized performance tests in school files so as to be able to study marks as indicators of competence. Standardized testing was not under our control, so the information is less complete than we might wish. There is, however, sufficient information on tests of standardized achievement for us to draw some basic conclusions. To anticipate Chapter 7 a little, teachers' marks are good indicators of standardized achievement in all three schools, particularly in later grades. Table 5.11 presents the correlations between report card marks and the available standardized measures. The upper portion of the first two columns refer to the Iowa Test of Basic Skills (ITBS) taken in grade three in the middle-class school. Second and third grade marks in this school correlate about .5 with both the reading and arithmetic sections of the test, while first grade marks correlate only about .35 with this third grade testing.

Table 5.11 Correlations Between Standard Achievement Measures and Marks for All Schools[1]

		Middle-Class White School		Lower-Class Integrated School		Lower-Class Black School	
IOWA TEST OF BASIC SKILLS Reading and Arithmetic sections Test taken in third grade		Reading Mark	Arithmetic Mark	Reading Mark	Arithmetic Mark	Reading Mark	Arithmetic Mark
First Grade	mid year	-.36 (182)	-.30 (180)	-.42 (86)	-.54 (113)	+.02° (41)	-.27° (35)
	year-end	-.39 (188)	-.38 (186)	-.38 (117)	-.63 (117)	-.14° (42)	-.15° (40)
Second Grade	mid year	-.55 (214)	-.48 (216)	-.42 (104)	-.52 (129)	-.42** (33)	-.33** (51)
	year-end	-.44 (215)	-.46 (217)	-.47 (137)	-.61 (136)	-.55 (39)	-.34** (50)
Third Grade	mid year	-.48 (242)	-.43 (248)	-.47 (120)	-.49 (163)	-.73 (33)	-.65 (61)
	year-end	-.46 (252)	-.48 (256)	-.53 (164)	-.55 (162)	-.44 (66)	-.57 (66)
GATES-MacGINITIE READING TEST Test taken in first grade		Reading Mark With Vocabulary	Reading Mark With Comprehension	TEST OF BASIC EXPERIENCE Reading and Arithmetic sections[2] Test taken in first grade			
First Grade	mid year	-.36 (144)	-.39 (144)	-.37 (88)	-.48 (86)	-.18° (62)	-.61 (84)
	year-end	-.45 (146)	-.49 (146)	-.39 (90)	-.52 (87)	-.35 (83)	-.67 (92)
Test taken in second grade				CALIFORNIA ACHIEVEMENT TEST[3] Reading and Arithmetic sections Test taken in second grade			
First Grade	mid year	-.50 (199)	-.51 (199)	-.59 (54)	-.65 (53)	-.43 (61)	-.59 (69)
	year-end	-.55 (121)	-.55 (121)	-.65 (58)	-.57 (59)	-.71 (64)	-.61 (72)
Second Grade	mid year	-.39 (144)	-.35 (141)	-.66 (66)	-.59 (66)	-.82 (25)	-.36** (62)
	year-end	-.59 (143)	-.53 (143)	-.54 (66)	-.61 (66)	-.81 (44)	-.37 (62)
Third Grade	mid year					-.36* (33)	-.40** (51)
	year-end					-.63 (46)	-.45 (50)
Test taken in third grade				Test taken in third grade			
First Grade	mid year	-.31** (84)	-.47 (82)	-.47 (58)	-.45 (56)	-.21° (50)	-.44 (47)
	year-end	-.47 (87)	-.58 (85)	-.64 (58)	-.54 (60)	-.29** (49)	-.29** (51)
Second Grade	mid year	-.33 (100)	-.40 (98)	-.62 (34)	-.62 (69)	-.53 (49)	-.31** (71)
	year-end	-.43 (100)	-.48 (98)	-.54 (75)	-.73 (77)	-.56 (50)	-.43 (69)
Third Grade	mid year	-.46 (129)	-.42 (125)	-.70 (84)	-.71 (80)	-.84 (36)	-.45 (78)
	year-end	-.53 (135)	-.49 (131)	-.69 (83)	-.65 (79)	-.58 (74)	-.43 (78)

---

[1] These correlations are negative due to the coding of high expectations as small numbers while high standardized performance provides large numbers. N's appear in parentheses. All coefficients are significant at the $p < .001$ level with one-tailed test unless denoted as:

- ° not significant
- * $p < .05$
- ** $p < .01$

[2] These correlations are for a test taken in May. The same test taken the preceding October provided almost identical correlations, based on slightly smaller N's.

[3] The second-grade CAT correlations are based on a test taken in October. The same test taken the following May provided comparable, though minimally smaller correlations, based on similar N's.

The lower portion of the first two columns concerning the Gates-MacGinitie reading test (vocabulary and comprehension sections), administered in all three grades, demonstrates a value of only .35. The first grade administration of this test provides values of about .4 while the second grade test consistently provided correlations .5 or above. The second and third grade correlations for the Gates-MacGinitie reading test do not substantially alter the .5 correlation suggested by the ITBS for these grades. This is especially true if one stresses the larger correlations and downplays the weaker correlations on the basis that there are many ways to fail standardized tests (distractions, failure to follow instructions, the need for a washroom, time wasted due to broken pencils, etc.) while there is only one way to do well.

We can correct for attenuation using

$$r_{tt} = \frac{r_{xy}}{(r_{xx} r_{yy})^{1/2}} \quad \text{with } r_{xy} = .5,\ r_{xx} = .95^2 = .90^{*},\ \text{and } r_{yy} = .80^{**}.$$

The corrected values round to the .6, as reported in Table 5.17 for the middle-class school.

We pause momentarily to indicate why a value of .80 was chosen as the r_{yy} value just above. "Alternate form" reliabilities for the Gates test for all grades cluster around .85 while Gr. 3 validity correlations with other tests are .84 (vocabulary) and .79 (comprehension); TOBE reliabilities (with a six week interval) are lower, .72 (math), .57 (reading); while the IOWA information is not available.

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*From Table 5.9
**From published reliability in test manual.

Table 5.12 provides the test-retest correlations that fortuitously arose when a change in testing schedules in the two lower-class schools provided the California Achievement Test (C.A.T.) and the Test of Basic Experience (TOBE) in both October and May of one school year. The .80 value we use seems a little conservative for the CAT in the integrated school and a little optimistic in the black school. The values for the TOBE are considerably lower even though all the relevant coefficients exceed those reported by the test designers for a comparable time span (see the note to Table 5.12). Considerably higher coefficients for a shorter time span were reported above. Thus there is some assurance that test administrations in these schools were not typically poor and that the .80 coefficient is a reasonable overall estimate of the published and actual reliabilities of the several different tests.

Turning to the columns of Table 5.11 concerning the integrated lower-class school,we take the best estimates of the correlations between marks and standardized achievement to be .65, .65, and .7 for first to third grades, respectively. The California Achievement Test correlations again suggest a slight boosting of the correlations above those suggested by the third-grade administration for the IOWA Test of Basic Skills. Correcting these values for attenuation and rounding provides the tabled coefficients (.8, .8, and .85 for reading and .75, .75 and .8 for arithmetic).

Surveying the final two columns of Table 5.11 concerning the black lower-class school suggests that first-grade marks there do not reflect standardized achievement particularly well while the second and third grade marks are only slightly worse indicators than in the integrated

Table 5.12

Standardized Achievement Test Replication Correlations

		California Achievement Test Administered in Grade Two			
		Integrated School		Black School	
		Replicate Score		Replicate Score	
		Reading	Arithmetic	Reading	Arithmetic
Initial Score	Reading	.89*** (65)	.69*** (65)	.72*** (65)	.54*** (62)
	Arithmetic	.57*** (66)	.80*** (66)	.21* (66)	.58*** (64)

		Test of Basic Experience Administered in Grade One[a]			
		Integrated School		Black School	
		Replicate Score		Replicate Score	
		Reading	Arithmetic	Reading	Arithmetic
Initial Score	Reading	.67*** (78)	.61*** (80)	.50*** (76)	.59*** (76)
	Arithmetic	.40*** (78)	.39*** (81)	.48*** (77)	.69*** (77)

[a] The TOBE Level L Examiner's Manual provides a comparable correlation matrix of

$$\begin{pmatrix} .36 & .36 \\ .38 & .37 \end{pmatrix}$$

for a Richmond, Va. Catholic sample of size about 200 using Form K and L but with a comparable time span.

*one-tailed $p < .05$.

**one-tailed $p < .01$.

***one-tailed $p < .001$.

school. For reading the summary values of .4, .6, and .65 are used for the first to third grades, respectively, which then corrected for attenuation and rounded supply the tabled values of .5, .75 and .8, respectively. For arithmetic the summary values are taken as .6, .5, and .5 and corrected to .7, .6, and .6.

Those values in general, and the .6 value from first-grade arithmetic in particular, draw additional support from mark-achievement correlations obtained from a repeated use of both the TOBE taken in first grade and the CAT taken in second grade. The mark correlations of an early TOBE testing and a later CAT testing are minimally smaller than those presented in Table 5.11. Since both these tests were administered in the integrated school with the same replication timings and provide similar correlations, we can place a little extra confidence in these coefficients.

One factor that could complicate our interpretations above is that the correlations between marks and the various standardized tests in Table 5.11 are usually based on minimally overlapping sets of cases. The potential problem this creates is that marks in any given year may not correlate well with a standardized test while those for the same grade level in another year may correlate well due to yearly fluctuations in teacher's marking policies. Thus using higher correlations from one year and test to rule out lower correlations for another test given to the same grade level in another year may not be entirely justified.

This potential criticism is strongest under two conditions: first, if the different tests are extremely highly correlated with one another, then any differential correlations with marks is due to marking inconsistencies and second, if restricting the correlation case base to include only those cases containing information on two standardized tests eliminates the pattern of weaker and stronger correlations. That is, if eliminating case base differences eliminates the systematic differences in the correlations we would be more suspicious that the systematic differences in Table 5.11 are cohort (marking) differences rather than testing differences. Examining both these concerns in the relatively few instances where children received more than one form of standard test indicates the tests do not correlate with one another excessively (ITBS reading total with Gates, comprehension $r = .71$ in Grade 2 and $r = .78$ in Grade 3 in the middle-class school; ITBS with Grade 3, CAT. $r_R = .62$, $r_A = .71$ in the integrated school and $r_R = .64$ and $r_A = .57$ in the black school; while Grade 2 CAT and the TOBE for the black school was $r_R = .28$, $r_A = .61$ and $r_R = .32$ and $r_A = .66$ for the first and second testing of TOBE, respectively. (The TOBE Manual Level L (Table 5.11) provides Grade 1 correlations between TOBE and C.A.T. as $r_R = .42$, $r_A = .46$ for a Richmond, Va. Catholic sample sample of about 184 cases.) Even with a consistent case base the standard tests provide differential correlations with marks.

CHAPTER 6

ESTIMATING THE MODELS

In the section of modeling strategy in the last chapter, we presented 6 cyclic models for the schooling process (Figures 5.6 to 5.11) to cover the first three grades of school. We discussed the rationale for model constituents and structure in terms of these particular models.

Actually estimation of these models proceeded in two steps, the first being the selection of the particular set of 6 cyclic models from among many alternatives, and the second being estimation of the structural parameters for the set selected. Parameter estimation, and discussion of the estimates, is the main topic of this chapter. But to make clear what our overall research strategy has been, we need to back up a little and discuss the winnowing process that led to selecting the particular set of models shown in Figures 5.6 to 5.11.

Selection of Two Models

Figures 5.6 to 5.11, as pointed out, are basically two models, one for the first grade year and another for the second and third grade years. The difference between the two is that the first-cycle of first grade is the start-up. In arriving at these models, we relied mainly on theory but we let the data offer some guidance as well. The theory we have discussed in earlier chapters. We will now review how the data guided us.

It cannot be over-emphasized that all decisions about model structure where data guided us were based on only one subsample, the odd-numbered cases. We first divided the data into random halves, altered all models for the middle class and integrated schools using information from only one half of the data, and then proposed the models given in Figures 5.6 to 5.11. This strategy, as explained earlier, allowed us to test the "final" models on a fresh set of data (the other half).

The alterations proceeded on the basis of goodness-of-fit, consistency from one model to the next, and judgment based on much other exploration of the data*.

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*Also many other kinds of analyses informed our thinking and they are alluded to from time to time. A number of them, elaborate cross-tabulations reported earlier (Entwisle and Hayduk, 1978) were especially helpful. We thought initially that log-linear models would be useful. We gave up that idea earlier. For several reasons, these models were not even useful as a supplement to cross-tab analysis of our data.

Most of the published data analyzed in light of log linear models consist of dichotomous variables. In such cases there is a direct correspondence between terms in the model and cells in the data matrix, for example failure to fit a 2 x 2 table using the data in the two margins is equivalent to a first-order interaction. Likewise in fitting higher order tables, say a 2 x 2 x 2 table, there are 8 terms in the saturated equation and 8 cells in the table. When the correspondence between model and matrix breaks down, as it does when variables have 3 or more categories, interactions can then arise in one or several cells and the interpretations of interaction terms immediately becomes dependent upon "ransacking" the cells. With variables having four categories, as expectations and marks in this research have, log-linear models lose conceptual clarity and impose a frame for analysis (matrices of 4 x 4 x 4 = 64 cells) that soon exhausts even a data set as large as ours. With the number of variables we must consider (SEX, IQ, RACE, etc.) the cells in any table quickly become more numerous than the number of observations.

There is the further problem that log linear models are hierarchical--a third-order interaction in a model dictates that all second-order interactions involving the same variables must also appear in the model. Our data often violated hierarchical patterns. We found, for example, that marks and expectations are not associated at one time but are associated later, implying a 3-way interaction in the face of no 2-way interaction.

Log linear models were unsuitable in other respects as well. If we find an interaction between marks and expectations, we could conclude that they affect one another but there is absolutely no way to disentangle reciprocal effects. Also measurement of change is extremely difficult--any scheme involving subtraction, say subtracting marks at the

Because of space considerations we cannot give a full account of all the variables we eliminated in the pruning process. The major variables eliminated were generalized self-esteem, a number of parent variables Rosenberg (1965) had earlier found related to generalized self-esteem (number of times the family ate dinner together in preceding week, the number of "interesting" dinner conversations involving the student that the mother recalled for the past week, the number of the child's friend's known by the parent), a number of other parent variables related to the home atmosphere (whether parents intended to help the child with homework, how far the child was expected ultimately to go in school), and variables based on forecasts of the kindergarten teacher concerning how well she believed the child would perform in first grade.

In removing variables from models, we placed a great deal of emphasis on our theoretical analysis and on consistency across models. This implies much more than an allegience to some particular χ^2 value. With a pairwise-present covariance matrix, it is easy to get a negative structural coefficient somewhere in the model, and consequently a poor fit, even though the rest of the parameters are close to what they would be if the offending parameter were removed. We did eliminate models giving negative values in the Ψ matrix (disturbance terms cannot have negative variances) but we did not eliminate models where a negative coefficient was occasionally observed for a link involving marks or expectation. In fact, with a total of 18 models it seems reasonable to accept coefficients in models with poor fits as long as they adhere to the pattern seen in models with good fits.

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end of the year from marks received earlier, raises issue involving ceiling effects, regression effects, and unreliability of change measures. Short of subtraction, if say marks at two times are studied in relation to expectations, interpretation becomes extremely cumbersome.

There is fortunately a great deal of potential consistency, for the models can be viewed in some ways as replicates across schools and also as replicates across the six time cycles.* That is, if the processes portrayed in the heuristic model have some validity, the schooling process cannot be altogether different from school to school. We expect, for example, that children will pay some attention to their significant others no matter what kind of school they find themselves in, or that the student's individual characteristics will have some effect in any school. Thus the models reproduced in Figures 5.6 to 5.11 are the starting point of estimation for all three schools. By the same token, human development is a continuous process, children in third grade are much like those in second or first. Thus, we expect consistency in the form of the model across cycles, and that a model for grade one should display the same general structure as one for grade two. We would be suspicious, for example, if IQ exerted positive effects in one cycle and negative effects in the next cycle. Also we would not like it if variables become less determinate with time, because children's behavior should become more predictable with advancing age.

Our study is exploratory in both substance and method, and it should be judged in that light. The models were invented by a series of judgments including many made before any data were collected. But alterations of the model made after some data were in hand were made only on the basis of examining the data for odd-numbered cases.

Implicit in what has been said about model selection is the idea that we began with many more variables than appear in the final models. In fact we fashioned models of the schooling process, based on our heuristic model, with as many variables as were theoretically relevant and practically feasible. This choice may strike some readers as arrogant: we credit ourselves with so much insight into the schooling process that we dared specify a process of enormous complexity. Other readers may see this choice as tasteless: with so many variables we could fit any set of data. One reason for starting with many variables, emphasized by Tukey (1975), is that in an uncharted domain it is probably better to begin with a large number of carriers and eliminate some, rather than to start with one or two variables and try to add more on. Another reason for including a large number of variables at the start was that, as pointed out in Chapter 3, we did have some guidance from theory, and even though the theory largely concerned older students and/or variables not altogether isomorphic with our own, all of the variables we included could be relevant.

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*Replications by cohort do not involve enough cases to support model estimations.

To sum up: to decide which variables to eliminate, as we said, our sturdiest criterion was judgment: the patterns among variables should make sense. As mentioned we could expect some consistency cycle by cycle, or from school to school. In addition "cut-and-try" procedures on one half of the data offered further guidance. Fit was only one of several pieces of information we weighed in judging a model and it ranked far down in our list of concerns. (Even when fit was good, pruning was often undertaken to eliminate superfluous variables--those with small first-order partial derivatives.) We tried to hold fast to our major theoretical guidelines and resisted altering a single model to improve fit. Even in the cases where fit is poor, therefore, the coefficients will be reported because they are the best currently available given our theoretical stance and the data at hand.

LISREL is enormously helpful in a winnowing process like the one we engaged in with half the data. Examination of partial derivatives, as already mentioned, was useful in deciding which variables could be eliminated without much harm to the overall fit. Just as useful, examination of these derivatives gave some clues about the validity of structure, specifically in certain critical instances whether one-way or reciprocal causation was appropriate. For example, the reader might question the initial placement of children's expectations ahead of marks in the grade one model--perhaps the two should be modeled as coincident in time. Examination of appropriate partial derivatives suggested such reciprocal paths were not appropriate. In addition the program could easily be used to estimate reciprocal paths, and a few runs convinced us that our initial assumption of one-way causation was more reasonable.

Remarks about Evaluating the Models

We estimated parameter values for the "final" models (Figures 5.6 to 5.11) for both subsample replicates and the full sample using Jöreskog and Sörbom's (1976) LISREL program. This program furnishes full information maximum likelihood estimates of parameter values adjusted for measurement error. Measurement assumptions were discussed in detail in Chapter 5. The even-odd replication strategy required that we estimate each model three times, once with even-numbered cases, once with odd-numbered cases, and finally with all cases. In the last section we discussed the usefulness of the even-odd replication strategy for pruning models. The strategy is also useful in other ways as well.

The even-odd replication is helpful in overcoming some of the limitations inherent in the sampling design. This kind of replication, as Finifter (1972:115) says, is shown to its best advantage in research like ours "...in those frustrating situations...where standard procedures are compromised and feasible alternatives do not yet exist." In particular, estimates based on both random subsamples after the form of the models has been chosen give some clues about the size and relative stability of model parameters.

As we pointed out in Chapter 5, the data from children in three schools do not constitute a probability sample. There is even some lack of independence between students by virtue of the fact that some shared the same classroom. Without a probability sample, standard errors of estimate cannot carry their ordinary meaning. On the other hand, we need some way to infer which parameters are relatively large. To help evaluate parameters in terms of sampling variability, we arbitrarily denote all structural coefficients with magnitudes equal to or greater than 1.5 times their standard errors as "significant," and others as "non-significant". Parameter sampling variability is further taken into account by the separate χ^2 fits of the model to each subsample replicate, to be discussed shortly. That is, a model tried on a fresh set of data usually fits less well than it fits the data used in its development. Therefore, a satisfactory fit on a fresh set of data is evidence that the joint sampling variability of parameters is within acceptable limits.

The random subsample replications help in still another way: by giving information on parameter sensitivity (see Green, 1977). In exploratory work such as ours a critical question concerns whether structural coefficients are significantly different from zero. Our assessment of parameter size is properly gross: we will decide merely whether a particular link should be left in the model or should be eliminated (sometimes called "trimming"). In addition to the size of the parameter relative to its standard error computed on the basis of all cases, the internal consistency of the parameter estimates on the two replicates can guide decisions to trim. On the basis of all cases we first judged whether a parameter was large enough to meet our arbitrary size criterion, and we then examined whether that parameter was consistent in sign in the two random replicates (The second criterion based on consistency of sign led to questioning only 5 connections in the 12 models.*)

In using the random subsample replication method, we first pruned models (eliminated variables) using only one-half of the data. Later we trimmed models (eliminated links between variables) using evidence from both halves of the data. This use of random replicates is considerably cruder than other uses mentioned in the literature. For example, it is possible to estimate regression coefficients from the first half of a data set and then compute the fit of the coefficients to the second half, and then repeat the process by fitting to the first half the coefficients estimated from the second half (see McCarthy, 1976). Such uses are concerned with relatively small differences in magnitude among the coefficients. Our interest is in gross structure not in small differences among parameters.

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*In the middle-class school, E_{C1} to E_{C1}; in the integrated school, ABS_2 to E_{A2}, ABS_4 to M_{A4}, PE_{A5} to M_{A5}, PE_{R5} to E_{R6}.

Other Comments on Modeling

We will say little about "indirect effects," and we never try to track down the source of all the variation in any endogenous variable. We will not employ a paradigm like that proposed by Alwin and Hauser (1975), but we will give standardized coefficients in tabular form for the sake of completeness.

In an exploratory study the best one can hope for is to point to variables that are probably important or unimportant as causal antecedents of others, no more. For example, to find, as we do, that children's earliest expectations are generally unresponsive to race is a "simple" conclusion in the sense that only one link is being discussed. But this "simple" finding could be of enormous significance if it holds up, for it could explain many other empirical findings. It would be silly to dwell instead upon the many small influences that "explain" the observed variance in children's initial expectations, because any set of antecedents could "explain" something. Or, to take another example, on children's very first report cards teachers assign better conduct marks to girls than boys, net of everything else. If conduct marks are an indicator of the level of a child's socio-affective development, then this early sex bias is important to recognize. It warrants more attention than other more tenuous effects, involving consideration of causal chains with several links, each of which must be regarded as problematic at this stage. Our models do not have a high degree of precision. Their basic structure is the main object of our inquiry. (See comments of Duncan (1975:65) on explanatory power).

Another important feature of this research needs emphasis: teachers' marks in reading and arithmetic are the two main cognitive outcomes. In

Chapter 7 we will show that teachers' marks predict scores on standardized tests, but the models estimated in this chapter show marks as the ultimate endogenous variables. Since each child interacts with one teacher over any one grade, his marks are tied to a single classroom. Peers' expectations are also tied to a particular classroom. The unit of analysis is therefore the child nested in a particular classroom environment. For this reason although "classroom" effects per se are not analyzed, our models are mid-range models of the kind described in Chapter 1. Our strategy combines the approaches taken by previous investigators because the unit of analysis is "child-in-classroom." (Like Pedersen et al. (1978), Rist (1970), and similar studies, outcomes may depend on "classroom", but like the Murnane (1975) study many teachers are included so the findings rest on a broader base.) The major advantages of our strategy are that it allows study of very early school achievement prior to the time when standardized tests are given, and that more important, the schooling process, and not merely its outcomes, can be studied. If sex or IQ or race affect teachers' evaluations differently, or if expectations and evaluations are as critical for schooling as many believe, our strategy offers some hope of testing these notions.

Note particularly that to combine models over schools would be inappropriate. The metric for marks is specific within schools. Also the schooling process, to the extent it differs between schools, would be obscured if all data were pooled.

The Models

Our major task was to estimate individually for each school the six models presented in Figures 5.6 to 5.11 with the full data set.

The covariance matrices used as input to the LISREL program are presented in Tables 6A.1 to 6A.18 for the six time cycles for each of the three schools. Correlation coefficients and pairwise present N's are also given in the same tables. For every structural connection in the models tables 6A.19 to 6A.36 contain metric coefficients (below the diagonal) for even-numbered odd-numbered, and all cases; the complement of the standardized disturbance term (along the diagonal); and the standardized coefficients for the full data set (above the daigonal).

The amount of information in these various tables requires a number of summaries for purposes of discussion. The first summary consists of a review of fit and explanatory power. The second summary is a review of the longitudinal structure of the models, school by school, illustrated with a set of figures. (Figures 6.1M, 6.1I, 6.1B, 6.2M, 6.2I, 6.2B, and so on, where "6.1" matches "5.6" of the last chapter and where "M", "I", and "B" denote white middle-class school, integrated lower-class school, and black lower-class school, respectively.) A third summary is a set of tables tallying all the structural coefficients associated with any particular variable. For example one table summarizes all the structural parameters directly associating sex, an exogenous variable, with all endogenous variables in the successive cycles.

Fit and Explanatory Power

To review a little, in estimating the parameters associated with models depicted in Figures 5.6 to 5.11, we used as input to LISREL (Jöreskog and Sörbom, 1976) the measurement assumptions summarized in Table 5.9

together with the covariance matrices presented in Tables 6A.1 to 6A.18. In every instance the models were estimated independently for odd and even halves of data drawn from the middle-class white and lower-class integrated schools. In the black school, the case base was not sufficient to permit a replication strategy, so parameters were estimated only once, on the basis of all cases. In addition, the model for the first half of second grade in the black school could not be estimated at all (the matrix was singular).

Fit

The models for the six cycles fit rather well with the exception of third grade models. (In Table 6.1 χ^2 values far enough from the associated number of degrees of freedom to occur only 5% of the time by random sampling are denoted by asterisks.) The models for the first cycle of third grade for five data sets and the second cycle of third grade for two data sets fit poorly.

It is rather surprising that fits for first and second grades are acceptable (three exceptions) while fits for third grade are poor for 7 out of 14 trials (almost uniformly poor for the integrated school in third grade). What accounts for this? We suspect that one reason is the smaller case base in third grade for all schools. This is clearly not the whole answer, however, because in the integrated school the fit remains poor when the case base doubles. Another possibility is that over the first three grades the process of schooling is changing in nature--marks in reading and arithmetic are the only first-grade academic outcomes, whereas by third grade spelling, social studies, and other

Table 6.1

Fit of Models According to Likelihood Ratio Statistics

	Figure 5.6		Figure 5.7		Figure 5.8		Figure 5.9		Figure 5.10		Figure 5.11	
	d.f.	χ^2	d.f.	χ^2	d.f.	χ^2	d.f.	χ^2	d.f.	χ^2	d.f.	χ^2
White Middle-Class School												
Odd Cases	18	12.5	42	37.6	96	151.4^*	42	50.9	96	111.5	42	50.8
Even Cases	18	23.6	42	30.8	96	151.1^*	42	40.1	96	248.3^*	42	52.0
All Cases	18	23.5	42	31.2	96	85.0	42	49.5	96	101.1	42	50.3
Integrated Lower-Class School												
Odd Cases	18	20.3	42	30.9	96	116.5	42	45.2	96	189.2^*	38	43.2^d
Even Cases	18	15.8	42	42.5	96	74.5	42	36.4	87	$171.7^{*,c}$	38	$59.0^{*,d}$
All Cases	18	22.6	42	41.3	96	88.7	42	40.2	96	170.0^*	38	$73.0^{*,d}$
Black Lower-Class School												
All Cases	18	6.7	42	38.6	96	-- [a]	42	$78.9^{*,b}$	96	178.6^*	42	44.6

[*] χ^2 values with asterisks denote values where $P(\chi^2) < .05$.

[a] Estimates for this model were not sensible even when all parent information at T1 was omitted. Between grades, as here, data are generally weaker than within grades.

[b] In order to invert the covariance matrix, it was necessary to delete E_{R4}.

[c] $ABIL_3$ was deleted for even cases.

[d] M_{R5} was deleted.

subjects we have ignored are also becoming important. Still another reason may be that the validity of variables is changing. At the start of school, children's academic expectations may be well tapped by a guessing game involving report cards; later on this kind of "projective" question may be less effective. We must say, however, that for many reasons we are more interested in the earlier than the later cycles. Given the difficulty of studying very young children, we are pleased that poor fits occur late rather than early. Also, models that fit poorly are not without value, and further work may make it clear why third grade models fit so much better in the middle-class than in the lower-class schools.

Explanatory Power

Table 6.2 summarizes determinancy of expectations and marks over the first three years of school. Summary data for parents' expectations over the same time period appear there also.

During the first year children's expectations are largely indeterminate. There is, however, a consistent improvement in predicting children's expectations over the first-grade year in all three schools, with predictability somewhere in the neighborhood of 15% for all areas (reading, arithmetic, and conduct). Similar patterns prevail for each school over first grade.

From first grade on, there is a continued drift toward better predictability of expectations, with perhaps 20% a median for the second year and 25% a median for the third year. The findings on school differences are not clear-cut. The higher levels of predictability for middle-class children at the end of grade three are balanced by higher levels of predictability for children in the other schools at earlier

Table 6.2

Coefficients of Determination

	T1			T2			T3			T4			T5			T6		
	Read.	Arith.	Cond.	Read.	Arith.	Cond.	Read.	Arith.	Cond.	Read.	Arith.	Cond.	Read.	Arith.	Cond.	Read.	Arith.	Cond.
Children's Expectations (E)																		
White Middle-Class School	5.1	8.8	6.3	12.6	15.8	14.5	11.3	28.7	21.3	16.9	14.1	17.8	19.3	35.0	29.0	35.5	29.4	22.4
Integrated Lower-Class School	6.0	6.3	1.6	12.5	15.0	16.6	20.7	37.0	30.0	18.3	24.1	16.6	20.2	13.3	31.0[b]	7.6	12.7	27.6[b]
Black Lower-Class School	3.5	14.1	5.6	27.0	11.3	23.0		c		a	13.0	31.2[b]	28.8	12.1	10.0[b]	18.1	25.3	29.5
Marks (M)																		
White Middle-Class School	18.4	20.4	31.4	37.4	44.2	57.3	43.0	37.0	31.0	52.4	55.5	59.0	38.0	22.2	19.9	47.9	39.9	48.2
Integrated Lower-Class School	57.5	35.1	23.9	76.5	64.4	64.2	88.8	51.5	52.5	56.6	69.8	64.8	77.8	48.2	35.5[b]	44.5	59.1	55.1[b]
Black Lower-Class School	24.3	63.0	18.0	34.1	56.9	63.9		c		82.0	74.7	52.7[b]	62.8	50.7	6.7[b]	85.1	73.8	62.6
Parents' Expectations (PE)																		
White Middle-Class School	56.8	55.3	19.8				50.5	44.4	48.7				64.4	47.9	40.2			
Integrated Lower-Class School	35.3	36.1	4.7				39.8	22.7	29.8				34.3	34.7	33.3[b]			
Black Lower-Class School	36.4	25.1	25.5					c					52.8	54.9	22.0[b]			

[a] E_{R4} had to be eliminated.

[b] These parameters are from a model that did not provide a satisfactory χ^2.

[c] Model could not be estimated because covariance matrix was singular.

times. All in all, it seems fair to say that insofar as these schools typify the effect of different social milieux on children's expectations, one milieu does not lead to more determinacy than another. Children's expectations, however, do respond increasingly to the hypothesized carrier variables as their time in school increases, as would be expected in terms of the children's growing maturity.

The degree of determinacy observed for children's marks is far higher than that for expectations. Furthermore the differences in mark determinacy by school are consistent and large, especially for marks in reading and arithmetic. In 20 out of 22 possible comparisons children's marks in reading and arithmetic are better determined in the two lower class schools than in the middle-class school. (The exceptions are minor--the black segregated reading marks at the end of grade one (34.2 vs. 37.4) and integrated reading marks at end of grade three (44.5 vs. 47.9)). Also the very high level of determinacy for marks in the lower-class schools is striking--in 18 out of 22 instances determinacy in reading and arithmetic exceeds 50%, with some values as high as 85 or 89%, while in the middle-class school in only 2 of 12 instances do values (slightly) exceed 50%.

Levels of determinacy in marks do not show the kind of continuous year-to-year growth as was noted for expectations. Within each year in the middle-class school there appear to be substantial and consistent increases from one semester to the next in reading and arithmetic. In the other two schools patterns are mixed.

The major conclusion is that, starting with the child's first report card, marks in the two lower-class schools are highly predictable. This high level of early predictability indicates that lower-class children's marks are responsive to ascriptive factors (sex, IQ) or to parent (ABIL, PE) and teacher (M) influences. This implies the child cannot do much because there is little slack to take up. Almost all the variance is accounted for, leaving little room for child influence on change. We think this finding may turn out to be one of the most important to come from this research.

By contrast, there is a degree of looseness in the middle-class school--each year teachers seem to start almost from scratch in forming their evaluations and by the end of third grade marks are not much more determinate than at the end of first grade. In other words, there is room for the child to exert some force in the system. By contrast, in the other two schools there is not much looseness.

Table 6.2 shows that parents' expectations in the middle-class school are much better explained initially than those in either of the two lower-class schools. By third grade our ability to predict parental expectations in the integrated school lags considerably behind the other two schools. One would expect determinacy in parents' expectations to increase as time passes, but there is no clearcut trend of this kind, although data from the black segregated school are really not complete enough to tell.

Longitudinal Summaries by School

Cultural context does not appear explicitly in the models. Each model, however, is estimated separately for each school so differences between models within any cycle or in structural patterns within one school over the three-year interval may be in part owing to cultural context. We say "in part" because obviously some portion of variance between schools is attributable to error.

Our intention is not to make a detailed comparison between schools. The exploratory character of this research hardly supports a comparison of structural coefficients parameter by parameter. Rather we will look at models in a broad perspective and concentrate on patterns, as we did just above in examining differences in determinacy by school. Patterns of influence among a number of variables that make sense in terms of other knowledge are unlikely to arise by chance particularly if they are replicated in the even-odd estimates. Also we expect some orderliness in the data;outcomes should become more predictable as children develop.

We have included all models in the following discussion regardless of fit, except for the third cycle for the black lower-class school (its matrix could not be inverted).

To aid discussion, from complete summaries presented in Tables 6A.19 to 6A.36, we have identified structural coefficients exceeding 1.5 times their standard errors and prepared figures 6.1M etc. summarizing this information. If two variables in these figures are not connected, the reason is that the parameter value associated with that connection was not large enough. Dashed lines indicate parameter values between 1.50 and 1.99 times the standard error. Solid lines indicate a parameter value 2.00 or more times the standard error. Also the parameter values are given in these figures. In the variable-by-variable summary to be given later in this chapter all coefficients are listed so the reader may compare coefficients with respect to absolute size. Figures 6.1 parallels Figure 5.6, Figures 6.2 parallels Figure 5.7, and so on.

The figures 6.1M etc. will now be discussed in order of school. All six cycles of models for each school will be viewed as a three-year-long status attainment process. Before proceeding we note that all variables except IQ and ABS are scaled in a fairly homogenous range. All expectations lie between 1 and 4, race is 0 or 1, sex is 1 or 2, and peer ratings lie between 0 and 1. This causes most coefficients except for IQ and absence in the diagrams to lie generally between zero and one. Because of this rough comparability in the relative range of most variables,the metric coefficients within any one figure tend to be interpretable much like relative beta weights,(although certainly not strictly so.) The signs of all coefficients connecting IQ to expectations, marks, and standardized achievement variables have been changed so the relationship is in the intuitively correct direction.

Middle-Class School

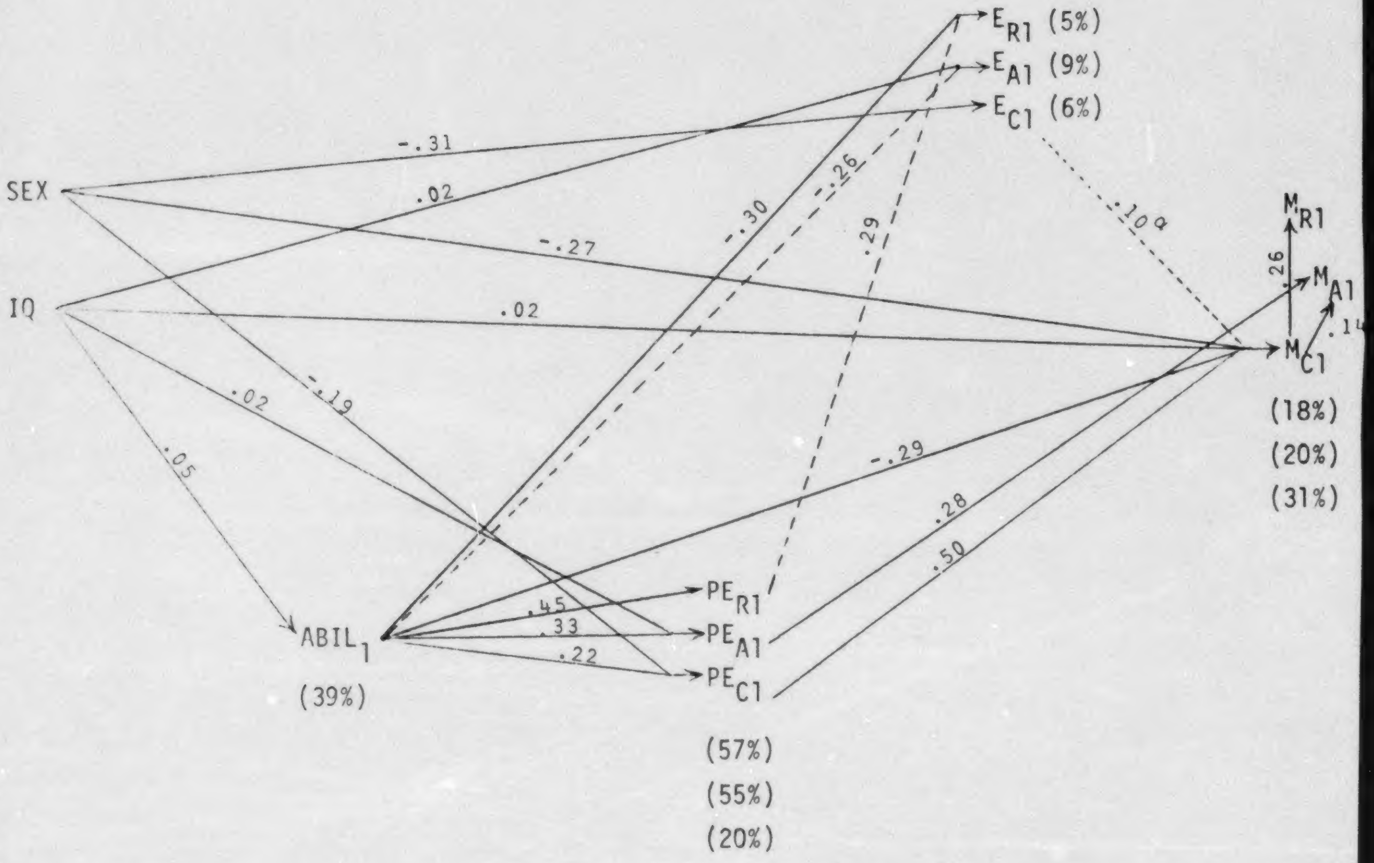
The first impression given by Figures 6.1M to 6.6M is that the variables are potent--there are many links with coefficients large enough to warrant inclusion. The second impression is that within years the links are more numerous than between years, implying that teacher effects are large.

Figure 6.1M

IQ affects parents' judgments about a child's ability to do schoolwork (ABIL) and ABIL is a strong determinant of parents' expectations for children's performance in all three areas. IQ contributes directly to

FIGURE 6.1M

Model for T1, White Middle-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E_{R1} (5%)
E_{A1} (9%)
E_{C1} (6%)
SEX
IQ
-.31
.02
-.27
.02
.02
-.19
.05
-.30
-.26
.29
.10a
M_{R1}
.26
M_{A1}
.1
M_{C1}
(18%)
(20%)
(31%)
-.29
.28
.50
.45
.33
.22
$ABIL_1$
(39%)
PE_{R1}
PE_{A1}
PE_{C1}
(57%)
(55%)
(20%)

[α] In subsample replications the sign of this coefficient was inconsistent.

parent expectations for arithmetic but not directly to expectations in the other areas. (In the other schools IQ contributes directly to parent expectations for reading or conduct, and not to arithmetic). In this school IQ is the only exogenous variable that contributes directly or indirectly to parents' expectations for the academic subjects.

Parents' expectations in conduct are affected by the child's sex, but they apparently do not expect girls to do better in reading nor do they expect boys to do better in arithmetic.

The coefficients of determination for children's expectations are low but sex affects children's conduct expectations, and IQ affects children's arithmetic expectations.

The patterns of relationships among variables for parents and children's are surprising. In particular there are two negative coefficients linking ABIL with children's expectations, one of -.30 between ABIL and E-R1 and another of -.26 between ABIL and E-A1. (The signs for these two coefficients are also consistently negative in the even-odd replication estimates.) Even though no such links are visible in the second or third grades, it seems unlikely that these negative relationships are attributable to chance, especially since the negative signs persist on (smaller) coefficients linking ABIL to children's expectations later in the same year, E_{A2} and E_{C2}. The explanation may be that if parents are very confident that the child has high ability to do schoolwork at the time when the child begins school, the child senses this and becomes somewhat anxious. We noted earlier (Entwisle and Hayduk, 1978) that in the middle-class school the variance in children's expectations was greater early in first grade than later, in particular that some children expected to get C's and D's although such marks on first report cards were rare in this school. After one round of marks the children appeared to be more aware of the actual school marking norms than they were initially. Perhaps the child reacting to what he perceives as parental overconfidence is instrumental--if he does better than he thinks he will the outcome is gratifying, while if he does worse the outcome is punishing.

Sex and IQ are both in the picture--girls' expectations for conduct marks are higher than boys and children of higher IQ expect to do better in arithmetic than children of low IQ. Thus to the small extent that children's expectations are explained, the pattern of relationships with exogenous variables appears reasonable. These patterns, together with the consistency in the relations between ABIL and children's expectations, suggest some validity in the expectations themselves.

The most noteworthy gap in Figure 6.1M is the lack of connections between children's own expectations and their marks, with the exception of conduct. These children appear not to be good judges of the likely quality of their own academic performance when they start first grade.

Parents' expectations, on the other hand, affect marks in both arithmetic and conduct. Parents seem to know the school marking norms in these subjects, and how favorably their child is likely to be judged against the norms.

Children's marks in conduct on the first report card are much better explained than their marks in the two academic areas, even though the conduct mark is an "extra" predictor of the other two marks. That is, marks in reading and arithmetic are seen as consequences of conduct, and so are determined by an additional variable. Marks in conduct are responsive to SEX, IQ, ABIL, PE_{C1}, and E_{C1}, every prior variable that could exert an effect. It is noteworthy that IQ affects conduct marks directly but not the other marks.

Conduct affects both reading and arithmetic, and to anticipate a little, the rest of the figures for the middle-class school usually also show connections from conduct to marks in the other two areas. The conclusion we draw is that the child's conduct is a critical determinant of academic performance early in the game. Furthermore, IQ "determines" conduct, but probably the children who are able to sit still, follow directions, and attend to what they are supposed to be doing are the ones who also score high on IQ tests. The link therefore, could be more associational than causal.

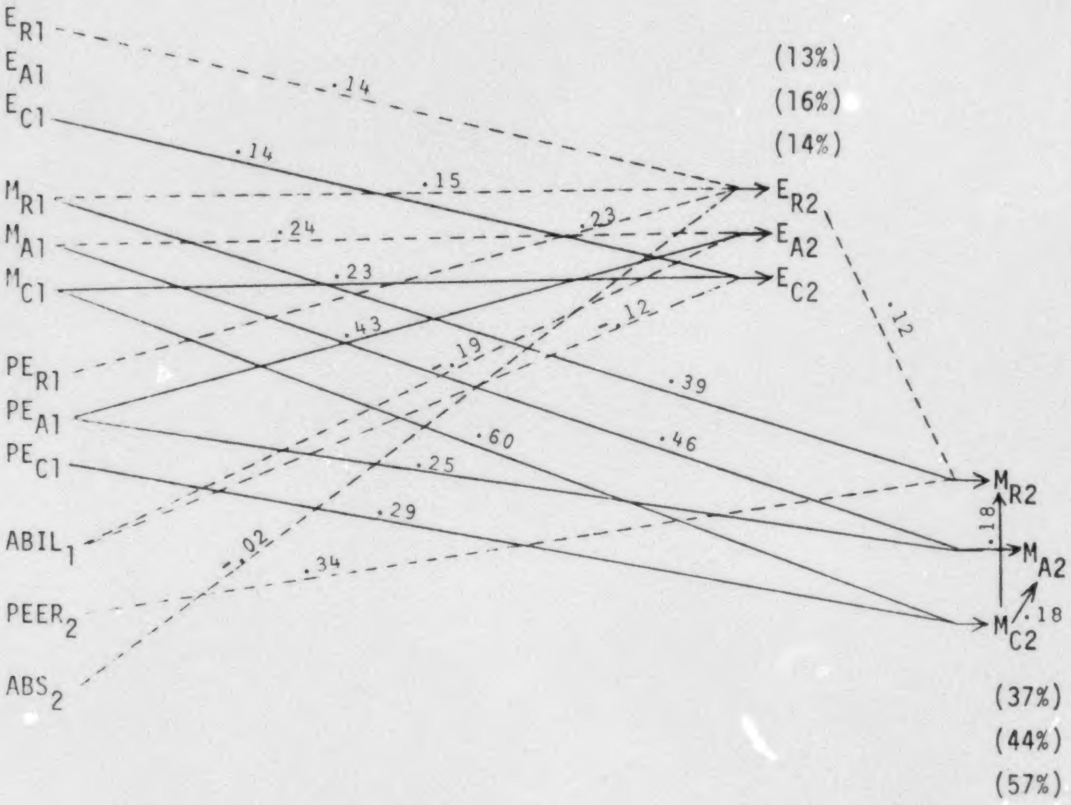
The central role of "conduct" variables in this earliest model of the school achievement process points to the importance of deportment, and as we remarked in the first chapter, the first year of school is undoubtedly critical because it is when children learn to read. Those who fall behind in first grade, for whatever reason, have a difficult time catching up and probably rarely do so. Those who do well are the ones who are "well-behaved".

Figure 6.2M

In the second part of first grade, the number of paths is comforting--links between children's expectations at the two times and links between marks at the two times are one indicator of reliability of measurement. Although children's expectations can change, it would be rather unsatisfactory if expectations at the end of the year were completely disconnected

FIGURE 6.2M

Model for T2, White Middle-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E R1
E A1
E C1
M R1
M A1
M C1
PE R1
PE A1
PE C1
ABIL 1
PEER 2
ABS 2
E R2
E A2
E C2
M R2
M A2
M C2
(13%)
(16%)
(14%)
(37%)
(44%)
(57%)
.14
.14
.15
.23
.24
.23
.43
.12
.19
.39
.60
.46
.25
.29
-.02
.34
.12
.18
.18

from those elicited earlier. But, as before, let us discuss the coefficients in chronological order.

First, ABIL again has borderline negative coefficients to children's expectations-- -.19 for arithmetic and -.12 for conduct. This continues a pattern already discussed.

Next, parents' expectations have sizeable direct links to children's expectations in both reading and arithmetic. Children's expectations are better explained now than formerly, but are still less well determined than any of the other endogenous variables in first grade. Perhaps the increased influence of parents expectations now compared to earlier stems from the opportunity parents have to convey their expectations to children as they talk about school or react to the child's performance. Note that the coefficients linking parents' expectations to children's expectations are .23 and .43--both in the expected direction as compared to the smaller coefficients associated with ABIL. It is tempting to speculate that when parents express expectations explicitly--perhaps by reading or doing arithmetic with the child--this raises a child's own expectations but when a parent expresses expectations in a more global fashion--perhaps by conveying the idea that the child will do as well as everyone else in the family or better than neighbor children--this may make the child anxious. Parent variables seem at least as powerful as feedback from the first report card.

Next we note that there are two links between expectations early in the year and those later, but these are smaller in magnitude than coefficients linking other variables to children's expectations. The persistence in expectations conveys the impression that children's expectations were beginning to take form earlier (as a consequence of sex, IQ, and other things) but that events during the year do quite a bit to mold them. For example, marks in all three areas have effects. The earliest feedback children receive, then, appears to shape the children's academic self-image.

At the end of the year the conduct mark again responds to parents' expectations in conduct. This mark, furthermore, is being rather fully accounted for, with the strongest determinant being the conduct mark given earlier in the year. No direct paths were estimated between sex and IQ and second semester conduct marks, but we must assume that these variables affect later marks because of the strong influence of early marks upon later marks.

Marks in arithmetic respond to parents expectations in arithmetic and to conduct marks, replicating the pattern noted earlier in the same grade. Marks in reading on the first report card were not accounted for by anything except marks in conduct and that conclusion also holds here, with two additions: first marks in reading affect later marks, and reading marks are responsive to peer expectations. Children's reading marks are thus consistent with peer judgments as early as such judgments could be measured. (Only reading marks respond to peer ratings, but since those ratings were obtained specifically in connection with a reading game, this exclusivity is not surprising. In fact, the finding to some extent validates the peer measurement procedures.)

In this middle-class school, no direct effects appear between parents' expectations for reading and reading marks. Parent influence on reading marks could flow through children's expectations, but the coefficients in Figure 6.2M suggest such effects are small. (The replication analyses lead to the same interpretation.) Thus we know that deportment affects reading performance, and once a reading mark has been given it tends to persist but other than that we remain very much in the dark about this important topic. Altogether however, reading marks in this school are being explained by the end of first grade almost as well as any academic marks over the entire three grades.

Remaining to be discussed are the exogenous variables introduced in the model in the second half of the year. The only link from $PEER_2$ is the one already discussed in connection with reading marks. ABS_2 affects children's expectations in reading and thereby possibly children's marks indirectly.

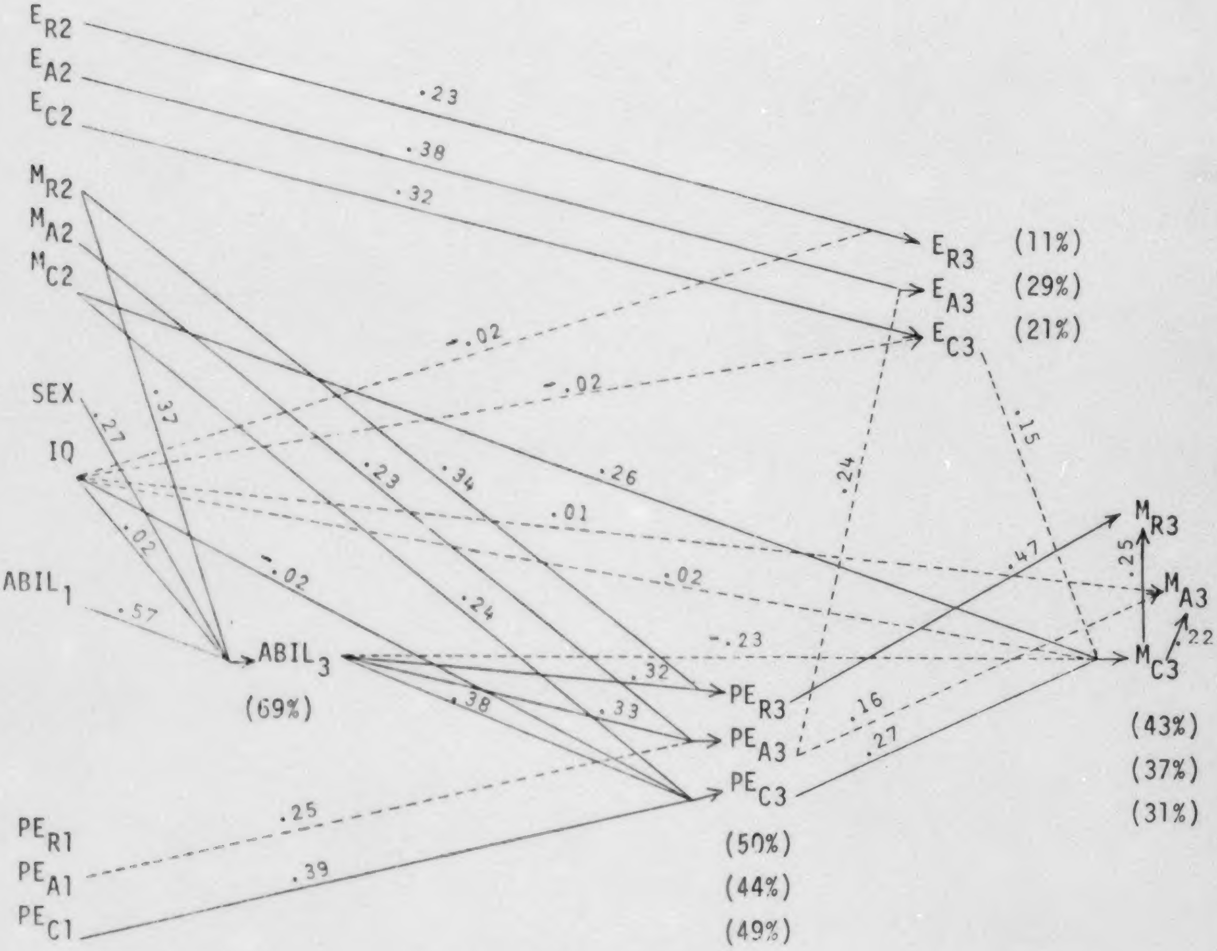
To sum up: every prior variable at the start of the second cycle, with the single exception of E-A1, has at least one connection with some subsequent variable. Also the determinacy of both children's expectations and their marks increases over the year. The absolute degree of determinacy in children's marks by the end of first grade--ranging from .37 in reading to .57 in conduct--is impressive, for it suggests that the model is picking up influences affecting children's early school attainment. The overall impact of conduct on cognitive outcomes is substantial.

Figure 6.3M

At the start of second grade SEX and IQ, are entered as exogenous variables anew. The rationale supporting their re-introduction is that a new teacher, and possibly a new set of peers, may react to sex or IQ in ways different from the child's first grade experience. Again variables will be discussed in order of introduction into the model.

FIGURE 6.3M

Model for T3, White Middle-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E_{R2}
E_{A2}
E_{C2}
M_{R2}
M_{A2}
M_{C2}
SEX
IQ
$ABIL_1$
PE_{R1}
PE_{A1}
PE_{C1}
.23
.38
.32
-.02
-.02
.27
.37
.02
.57
-.02
.23
.34
.26
.01
.02
.24
$ABIL_3$
(69%)
-.23
.32
.38
.33
.25
.39
PE_{R3}
PE_{A3}
PE_{C3}
(50%)
(44%)
(49%)
.24
.47
.16
.27
.15
E_{R3}
E_{A3}
E_{C3}
(11%)
(29%)
(21%)
M_{R3}
M_{A3}
M_{C3}
.25
.22
(43%)
(37%)
(31%)

Somewhat contrary to our intuition, sex and IQ have no appreciable effects on marks except that IQ affects the conduct mark. The only noticeable effects of re-introducing these variables are noted on parents' estimates of their children's general ability to do schoolwork (ABIL) and the effects of IQ on children's expectations in reading and conduct.

Whereas initially parents rated boys and girls as equally likely to do good work, after one year in school parents are more sanguine about girls. IQ again impacts on ABIL., perhaps because some children were tested during the year or because parents became acquainted during the first grade year with test results. In any case, there is considerable consistency in parents' estimates of children's ability to do schoolwork at the beginning of both first and second grade, but some modulations occur as a consequence of school experience.

Contrary to what was observed in first grade, however, in second grade the influence of ABIL extends only to the other parent variables, the specific expectations PE_{R3}, PE_{A3}, and PE_{C3}, and not to children's expectations. There are not negative links from ABIL to children's expectations in Figure 6.3M, and signs of the (small) coefficients are positive in 5 of 6 instances in the replication analysis. The curious negative effect emanating from ABIL to children's expectations in first grade is therefore no longer present and not even hinted at. ABIL seems about as influential as it was in first grade in determining parents' expectations for reading, arithmetic and conduct, and there is some suggestion of an inverse relation with marks in conduct.

Parents' expectations in second grade are more completely accounted for than they were in first grade, particularly in conduct. In view of the fairly large coefficient linking $ABIL_1$ to $ABIL_3$ (.57) and the rough parallel between coefficients from ABIL to PE in the two years, the pattern for PE_{R1} to PE_{R3} and PE_{A1} to PE_{A3} was unanticipated. Apparently parents do not alter their overall impressions of their child's scholastic ability but they do alter their ideas about levels of performance in the academic subjects. Parents' expectations for reading and arithmetic marks rather sensibly respond to marks the child received in the preceding year. There is also an inverse link between IQ and parents' expectations in conduct--high IQ implying low parent expectations. The sign is consistent in the parallel replications so we are not inclined to ignore it. We suspect its interpretation, like that for SEX or ABIL, hinges on parents' experience with the school, perhaps the realization that school organizations do not encourage exploratory activity or the inquisitiveness one associates with the outlook of a bright six-year-old.

The lack of connections between parents' expectations and children's expectations in second grade, except for the weak connections to children's expectations for arithmetic, is at variance with the overall pattern in first grade, and to anticipate a little, the third grade pattern resembles that seen in second. Children's expectations in reading and conduct do respond to IQ, however, and our conclusion is that children's expectations are mildly responsive to parents and IQ in first grade and second grade, but that thereafter experience in school, particularly marks, is the major force shaping children's expectations.

Children's expectations in second grade are somewhat better determined than in first grade, although reading expectations remain noticeably labile--11% at the beginning and 17% at tne end of second grade. The clearest links from first to second grade are those between expectations themselves. It is remarkable that links fail to appear between marks at the end of first grade and expectations in the first part of second grade, especially because marks in first grade had some impact on expectations while children were still in that grade. The explanation is entirely speculative but we suspect that children are aware of the re-shuffling that occurs with a new teacher--note that there are no links between first and second grade marks in reading and arithmetic.

Children's conduct marks in the first part of second grade, as earlier, respond to parents' expectations for conduct and to previous marks in conduct. With a new teacher conduct marks are about as indeterminate as they were early in first grade, however (31% at both times). In fact the main impression about conduct marks early in second grade is that they are more simply explained that conduct marks early in first grade. Sex has no direct effect, for instance. One weak link deserves attention, namely that children's expectations for conduct shape their mark in conduct. Children may have more efficacy in determining their classroom deportment than in determining their own proficiency in reading or arithmetic. One would think that a child who tried hard, or one who was more considerate of his peers, would receive a better mark in conduct. This seems to be true to some extent at the start of both first and second grades.

The continued direct and sizeable link between parents' expectations and conduct could mean that teachers shade a conduct mark to please (or appease) parents. That is, suppose a parent is active in PTA, gladly accompanies the class on fieldtrips and visits school whenever invited--in other words is a good citizen as far as the child's school is concerned--about the only way the teacher can legally reward this conscientiousness is to give the child a higher conduct mark. The child, too, given the set of parent activities just described, may be more readily importuned to respond to his parents' expectations because he is made conscious of those expectations when he and his parents share in school activities.

Again marks in reading and arithmetic react to conduct marks. There are no other direct links to either reading or arithmetic marks, however, except for parents' expectations. The first marks children receive in second grade are better determined than their first marks in first grade, and if anything the child's conduct is playing an even larger role. That parents' expectations are influential could imply that parents do things at home to help. With reading, after the child has learned some of the basic decoding skills, he and the parent can read together. Similarly when the child knows a little arithmetic, parents can drill the child.

There are no links from first grade to second grade marks in the academic subjects. At first thought the lack of such connections seems odd, and it must be confusing to the children. But it may have a beneficial effect in that each year children start off with something of a clean slate. Consistency in marks between years might seem important, but in another sense it could be locking the child into a tight trajectory making this year's proficiency depend very much as last year's.

All children included in this research can learn to read or do arithmetic if instructed "properly". Therefore to tag some in first grade as noticeably better or worse than others, and then to permit these tags to go largely unmodified as children move up through the next grade, could be worrisome. In fact, as we noted earlier, the persistence of marks is a major pattern in the two lower-class schools, and achievement there is less (See Table 5.6 for grade equivalent scores in the various schools) although we would certainly not care to take persistence as the only cause of inter-school differences in achievement.

Figure 6.4M

In the latter half of second grade for the first time we noticed definite feedback cycles between children's expectations and their marks. Marks affect expectations, expectations affect marks, and both persist from one point in time to the next. We will now discuss this figure in the same order as we discussed earlier figures.

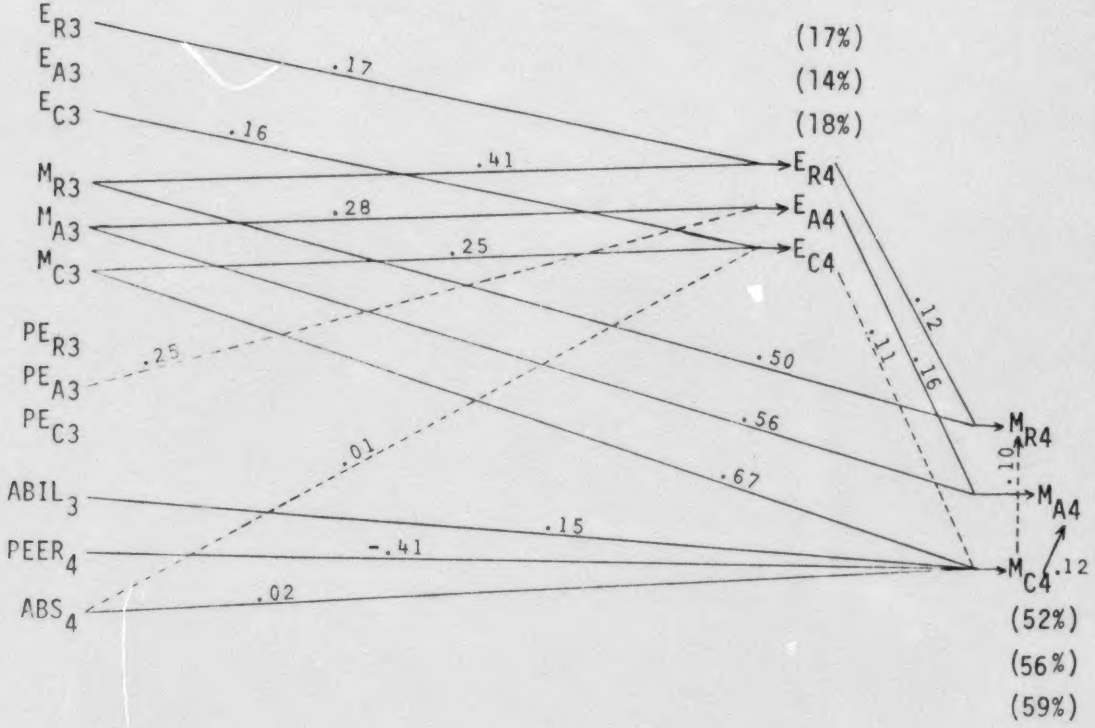
ABIL_3 has a link to year-end conduct marks. This is hard to explain in the absence of a similar link to first semester conduct marks and is the first occurrence of such a path since the first cycle. We will not discuss it further.

The connection from peer rating to conduct might seem anomalous--high ratings predict low marks--but it could be interpreted as reasonable. Since this finding is isolated and does not occur in other cycles in this school, we choose to ignore it, however.

ABS--more absences lead to lower conduct marks--is a finding that deserves modest attention. The scaling of this variable--number of days absent per year--in relation to the other variables explains its small magnitude. (For the entire sample this coefficient is .01 in first

FIGURE 6.4M

Model for T4, White Middle-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)


E_{R3}
E_{A3}
E_{C3}
M_{R3}
M_{A3}
M_{C3}
PE_{R3}
PE_{A3}
PE_{C3}
$ABIL_3$
$PEER_4$
ABS_4
.17
.16
.41
.28
.25
.25
.01
.15
-.41
.02
.50
.56
.67
.12
.16
.11
.10
.12
(17%)
(14%)
(18%)
E_{R4}
E_{A4}
E_{C4}
M_{R4}
M_{A4}
M_{C4}
(52%)
(56%)
(59%)

grade also, although at that time the variability in number of absences is sufficient to cause us not to pay attention to a coefficient of that size). Absences could impact on school performance in the early grades by causing children to be inattentive when they are unfamiliar with the course of the lesson. Three coefficients of about the same magnitude suggest that ABS should not be altogether discarded.

Parent expectations have considerably less impact at the end of second grade than they did earlier. Their expectations in arithmetic apparently affect only children's expectations and not marks as was true earlier in the year.

By far the most impressive connections in this cycle are those among marks and expectations. Continuing the pattern seen earlier in second grade, there are links from expectations at the beginning of the year to those at the end (arithmetic is an exception) although the coefficients (.17 and .16) are smaller than similar ones in the immediately preceding cycle (.23 for reading and .32 for conduct).

There are also distinct links between marks early in the year and those later, and if anything they are slightly larger than coefficients within first grade. Within grades, then, there is a pattern of mark persistence but a lack of persistence between grades. In addition, there is more determinacy in conduct marks at the end of the year, (59% as opposed to 31% earlier), and a small increase in determinacy for academic marks as well (9% in reading and 7% in arithmetic).

For the first time we see unequivocal links between children's expectations and their marks in the two academic areas. By the end of second grade children's expectations have some influence on performance although the influence is weak compared to the influence of prior performance. Yet clearly the child's ideas about his own capability exert separate and noticeable effects.

For the first time, conduct performance affects only one academic area (arithmetic), heralding a pattern that will be observed for the remainder of our observation period. What may have happened is as follows. Early in the process of school attainment almost all effects are mediated by conduct, and conduct itself persists in a steady manner (conduct marks connect to one another within grades and between first and second grade). Conduct affect _initial_ achievement levels in the academic areas and once set, these levels are the prime determinants of future performance. The child who has not done well in reading or arithmetic in first grade is unlikely to do well in second or third grades, irrespective of conduct.

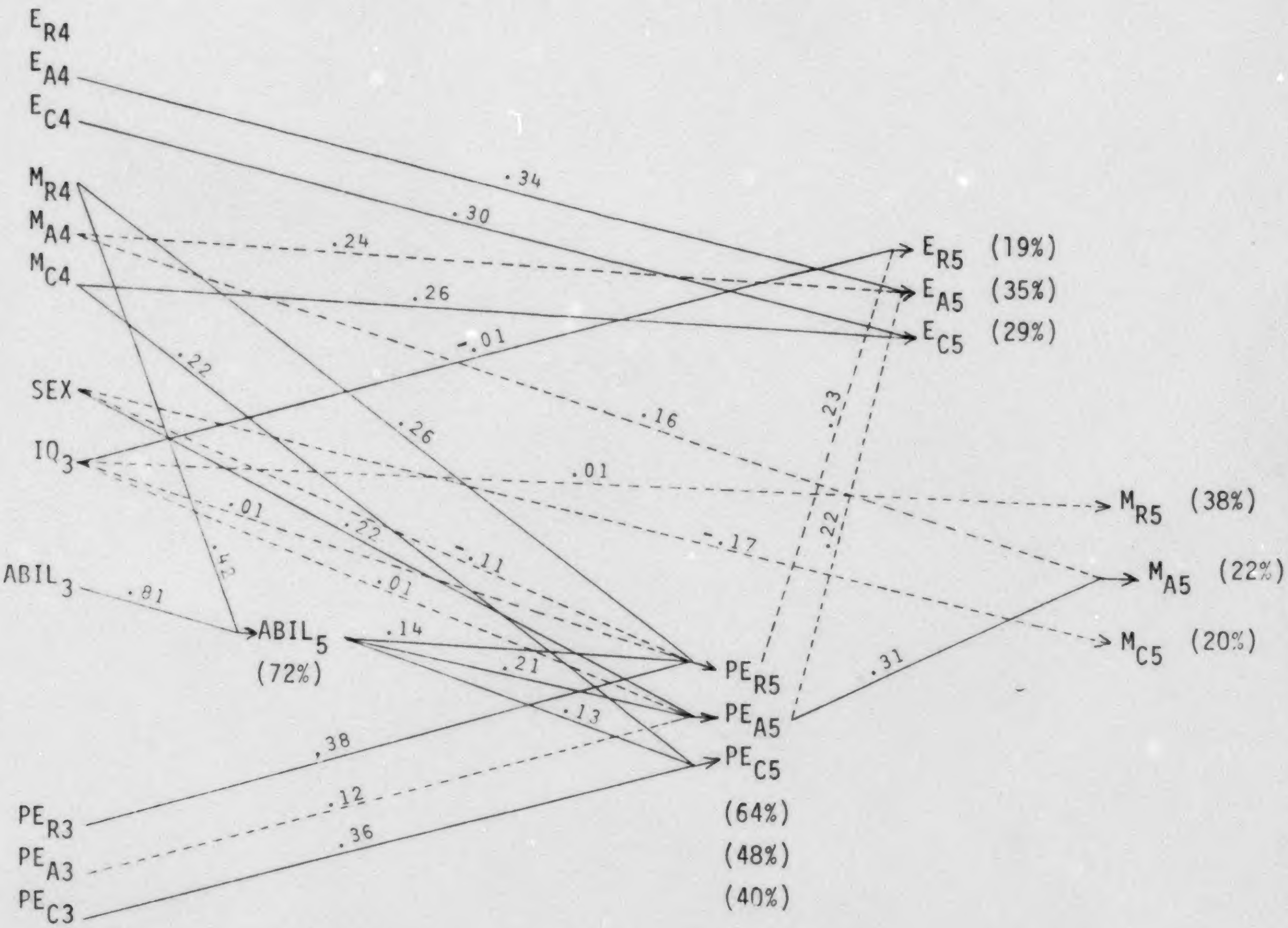
Figure 6.5M

Surprisingly the picture in third grade is not as clear as it was in the earlier grades although children's expectations are more fully accounted for (19%, 35%, and 29% for reading, arithmetic, and conduct, respectively).

Sex, which directly affected only parents ABIL estimates in grade two, has several effects here, but mainly again with respect to parents. Sex affects parents' expectations for both reading and arithmetic, favorably for girls in reading and favorably for boys in arithmetic. Sex also again has a direct connection to marks in conduct, also with an advantage to girls. For whatever reason, as time passes parents are

FIGURE 6.5M

Model for T5, White Middle-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)


E_{R4}
E_{A4}
E_{C4}
M_{R4}
M_{A4}
M_{C4}
SEX
IQ_3
$ABIL_3$
$ABIL_5$
(72%)
PE_{R3}
PE_{A3}
PE_{C3}
.34
.30
.24
.26
-.01
.22
.16
.26
.23
.01
.01
.22
.22
-.11
-.17
.42
.81
.01
.14
.21
.13
.31
.38
.12
.36
E_{R5} (19%)
E_{A5} (35%)
E_{C5} (29%)
M_{R5} (38%)
M_{A5} (22%)
M_{C5} (20%)
PE_{R5}
PE_{A5}
PE_{C5}
(64%)
(48%)
(40%)

beginning to see the sex of their children as more critical in determining their expectations.

IQ shapes parents' expectations for reading and arithmetic and directly impacts the reading mark in the first cycle of third grade. This is the only instance in which a direct connection occurs between IQ and marks in the two academic areas in this school. It probably signifies that teachers are beginning to mark more nearly in line with objective standards of performance whereas earlier they attempted to mark in terms of effort. As we note elsewhere, it is probably very difficult not to base marks at all on the absolute quality of performance.

Parent's expectations tend to persist from one year to the next (paths from PE_{R3}, PE_{A3} and PE_{C3} to PE_{R5}, PE_{A5} and PE_{C5}, respectively) and also whatever portion of the parents' expectations is general, mediated by ABIL, is accounted for by persistence of the ABIL variable from grade two to grade three. More diagnostic, perhaps, is that previous marks have effects on parents' expectations in reading and in conduct. Parents' remain uninfluenced by their children's expectations, however, so apparently they respond to teachers, other parents, or their knowledge about schooling in general rather than to their own children in setting their expectation levels.

In the very first cycle, we noted a direct link between IQ and children's expectations for arithmetic, and here there is a link between IQ and children's expectations for reading. Despite this, we cannot help but remark the fluidity of children's reading expectations. Even after more than two years in school, they are the least well determined of children's expectations (only 19%) and are the only instances at the start of third grade where no direct link exists between expectations held at the end of grade two and those at the beginning of grade three. Also prior marks, although affecting children's expectations for both arithmetic and conduct are not direct predictors of children's reading expectations.

In every cycle there has been an instance where either children's reading expectations or their arithmetic expectations responded to parent variables,even if not always consistently from cycle to cycle. We see responses of that kind here.

No connections exist between children's expectations early in third grade and their marks, duplicating a pattern seen at the outset of grade two, and probably reflecting children's ignorance of the new teacher's marking standards. In fact, the single path from year-end second grade marks to marks at the beginning of grade three (in arithmetic) is evidence of standards changing once again.

A new influence on marks is that of IQ, already mentioned, and another relative novelty is a sizeable direct effect of sex on conduct marks.

The only thing remaining to be noted is the substantial direct effect of parents' expectations upon arithmetic. At the same point in second grade there were direct effects of parents' expectations on all three kinds of marks. Our preferred explanation remains similar--by this stage of the game if parents hold high expectations there are various ways they can improve performance, including supervision of homework. Actually it may be much easier for parents to lend a hand in arithmetic because the performance criteria are more clear cut.

Figure 6.6M

By the end of third grade all variables are still very much in the picture. The new exogenous ones, peer ratings and absence, are again efficacious. Absences again affect marks in conduct. Peers, on the other hand, now have a direct positive effect on reading performance. While reasonable, the magnitude of this effect is actually no greater than magnitudes of peer effects on the other two variables (.28 for arithmetic and .30 for conduct) (This kind of consistency was not present earlier when a single inverse effect was associated with marks in conduct). The signs are consistent in every even-odd breakdown. Consistent peer influences are probably beginning to form, by the end of third grade.

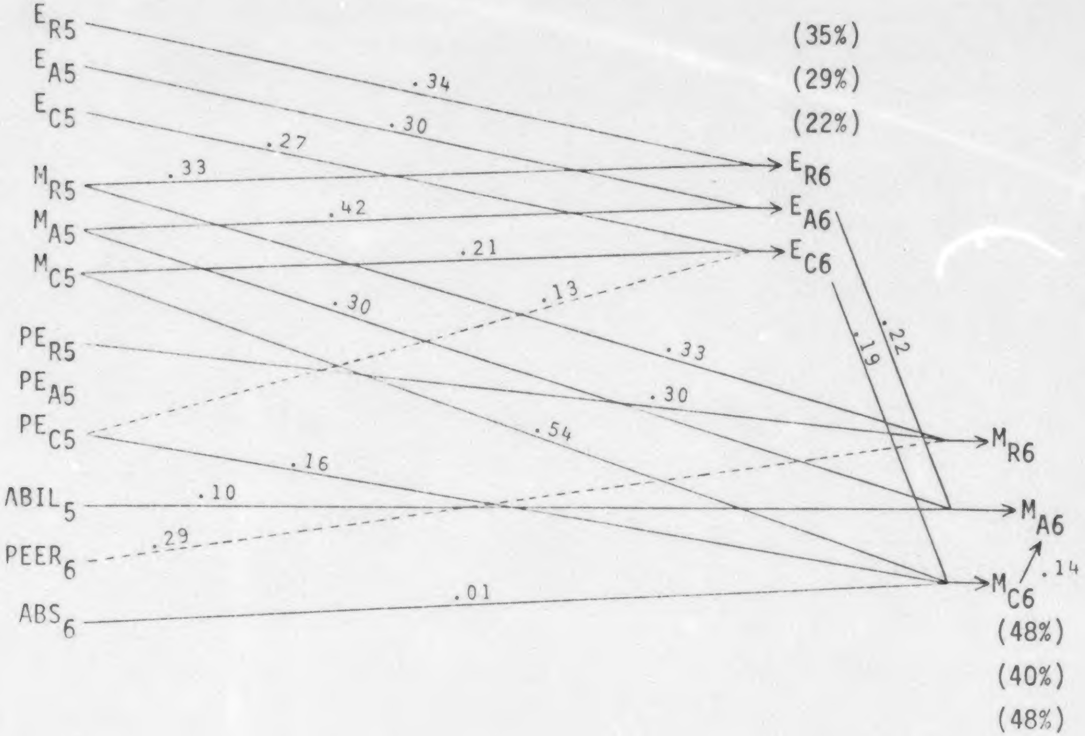
Parents' influence is still part of the picture. There is only one connection between parents' expectations and children's expectations (conduct) but parents' expectations in reading and conduct both impact children's marks in those areas. Putting these effects together with links noted earlier between parents' expectations and children's performance in arithmetic, we conclude that these middle-class children's parents exert a considerable impact on all performance areas over the first three grades.

Again ABS affects only marks in conduct, duplicating what was noted for second grade.

There is a relatively high level of persistence in children's expectations over the third grade year and by far the highest degree of determinacy in children's reading expectations found so far (35%). Children are also processing the information provided them by first semester marks in third grade, for their year-end expectations are influenced by earlier marks in every instance.

FIGURE 6.6M

Model for T6, White Middle-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E_{R5}
E_{A5}
E_{C5}
M_{R5}
M_{A5}
M_{C5}
PE_{R5}
PE_{A5}
PE_{C5}
$ABIL_5$
$PEER_6$
ABS_6
(35%)
(29%)
(22%)
E_{R6}
E_{A6}
E_{C6}
M_{R6}
M_{A6}
M_{C6}
(48%)
(40%)
(48%)
.34
.30
.27
.33
.42
.21
.13
.30
.33
.30
.54
.16
.10
.29
.01
.22
.19
.14

Children's marks are not better determined at the end of third grade than they were at the end of second, an important observation noted earlier in the section on determinacy. In fact children's expectations for reading are not a critical determinant for reading marks in third grade as contrasted with second. Conduct performance does not shape reading performance to any noticeable extent either. The three effective influences are previous marks, parents and peers.

Children's arithmetic marks respond directly to conduct and one parent variable (ABIL), and also to children's own expectations.

Conduct marks are accounted for in terms of parents' expectations, children's expectations, previous marks and absences. Again this variable responds to many of the variables in the system.

Lower-Class Integrated School

Figures 6.1I to 6.6I refer to models for the integrated school (approximately 60% black). As Table 5.5 indicates, the socioeconomic status of pupils in this school is noticeably lower than the status of pupils in the middle-class school but IQ, as measured in first grade, does not differ between these schools as much as one might think. By third grade the difference between schools in IQ is substantial.

The data in Table 6.1, indicating the overall fit of the models, show poor fits for both third grade models in this school. Some reasons for this were discussed earlier. The first possibility was that in trying to fit so many models, some are bound to lie outside the .05 limits. This possibility cannot be ruled out. However all the poor fits occur for third grade, so sampling fluctuation is not an appealing explanation.

Other possibilities are poor specification and decline in validity of measures.

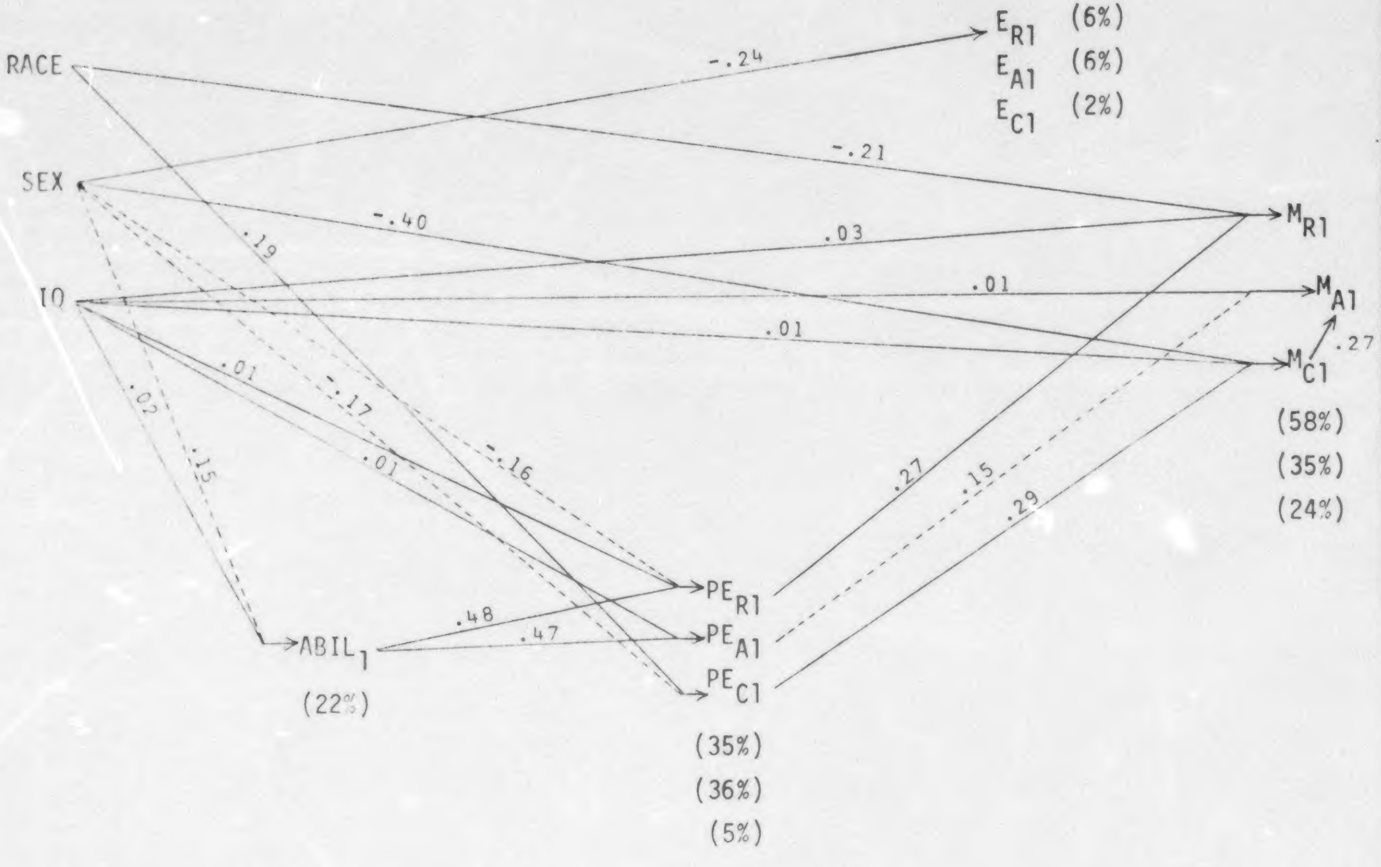
However, even though the models fit poorly we have decided to reproduce the coefficients as shown in Figures 6.5I and 6.6I, exactly as for the models in the middle-class school because, although the models may be faulty, they represent the best information we have available at this time. Lower-class children are much more difficult to work with than middle-class children, and we did exercize extraordinary care in trying to sample the opinions of these children and their parents. It appears, at least from the gross structure of the model in the first two grades, that we were as successful in the integrated lower-class school as in the white middle-class school. Also this school, because it is integrated, offers the only opportunity to examine the impact of a child's race unconfounded by between-school factors. In previous exploratory analyses (Entwisle and Hayduk) we found little variance attributable to race even in cross-race comparisons of teachers of the two races marking children of the two races, and in these models likewise there are few effects attributable to race. Over the entire three year period there are only four structural coefficients that reach even our relaxed criterion for size (1.5 times the associated standard error). Two occur in the very first cycle, the others in the third. After that there are no effects attributable directly to race even though race was introduced as a "new" exogenous variable again at the start of third grade.

Figure 6.1I

We will follow the same strategy as before, discussing variables insofar as possible in order of their chronology in the model.

FIGURE 6.1I

Model for T1, Integrated Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



RACE
SEX
IQ
E_{R1} (6%)
E_{A1} (6%)
E_{C1} (2%)
-.24
-.21
-.40
.19
.03
.01
.01
.01
.02
.15
-.17
.01
-.16
M_{R1}
M_{A1}
M_{C1}
.27
(58%)
(35%)
(24%)
.27
.15
.29
PE_{R1}
PE_{A1}
PE_{C1}
(35%)
(36%)
(5%)
$ABIL_1$
(22%)
.48
.47

Race has two significant effects. Whit[illegible] have higher expectations for conduct than black parents, but ve[illegible] of the parents' conduct expectations is determined (5%). Th[illegible]this effect of race probably justifies little attention.

The effect of race on first marks in re[illegible]ith sex and IQ effectively controlled, is another matter. [illegible] from the coefficient of -.21 (blacks coded 1, whites code[illegible] blacks receive higher marks in reading on their first repo[illegible]than whites. The overall summary of average values given for [illegible]ables (Tables 5.2, 5.3, and 5.4) however, shows very small diff[illegible]between average first marks in reading given blacks or white[illegible]is holds for both the odd and even replications. The coeffici[illegible]he odd and even replicates are both negative, and all of the[illegible]derived from internal consistency argue that the negative link is [illegible]pling fluke, although of course that cannot be altogether ruled ou[illegible]seems the most likely explanation is that the pair-wise present da[illegible]hich the coefficients are based, is more biased than the overall s[illegible]hat is, black children who have missing data are apt to be low[illegible]ir distribution than whites who are missing. This is to argue th[illegible]hildren whose parents could not be reached or who declined[illegible]their expectations have children on the average lower than whit[illegible]fused. We are not very happy with this explanation because we [illegible]ay to check it. Perhaps since this is the only effect linked [illegible]n this model it should be disregarded. All other variables [illegible]grade except race do impact on year-end marks. The coefficien[illegible]ted with race and year-end marks in reading are in opposite di[illegible]n the even-odd

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replication and effects of race on arithmetic and conduct marks do not approach a size to suggest any effect either early or late in the year.

Sex has a number of effects worth noting, all intuitively reasonable. Girls generally have higher expectations for reading than boys but no role overall in determining children's expectations and parents expectations for conduct.

First marks in reading are well determined (58%), and IQ has a substantial influence. IQ has effects on marks in arithmetic and conduct as well, but smaller than is true for reading. The reader will recall that because of the way variables are scaled the IQ coefficients are small in absolute magnitude compared to other variables. The coefficient observed here is associating IQ with reading marks is by far the largest so far observed. IQ affects parents' estimates of children's ability to do schoolwork and also parents' expectations for reading and arithmetic.

Parents' expectations, not particularly well determined, seem to be compounded of an overall ability estimate modulated by performance in the specific area. As in the middle-class school, parents seem to hold some overall opinion about their child's "true ability" that they then modify when they attempt to predict how well the child will do in any specific area.

Parents' expectations have no connections to children's expectations, but do impact on children's marks in all three areas.

Conduct performance affects arithmetic performance, but apparently not reading. This is somewhat unexpected.

In this school, as we have already noted, IQ is very important in determining reading marks. Discounting the effect of race on reading performance for the reasons discussed earlier, we see reading responding somewhat to parents' expectations but more strongly to IQ. Since a large coefficient of determination (58%) characterizes the first mark in reading, the major conclusion seems to be that the kinds of skills tapped by IQ tests and which the child possesses before he starts school, are the major determinants of the first reading mark. First marks are relatively low, furthermore.

Arithmetic performance is also strongly affected by IQ.

Overall this model suggests that the exogenous variables have considerable effect, particularly IQ. Children's expectations are not well accounted for but the first reading mark is surprisingly well determined.

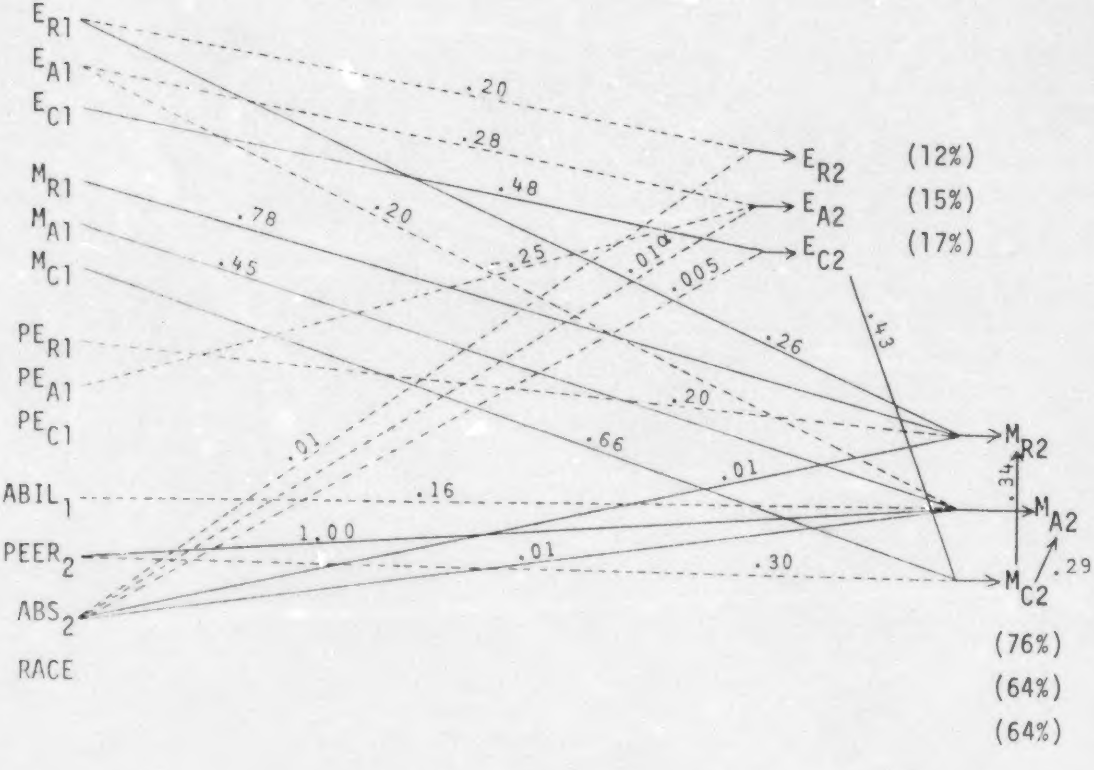
Figure 6.2I

The amount of determinancy in year-end expectations is greater than that noted earlier (12%, 15%, and 17% compared to 6%, 6% and 2%) and accounted for mainly by persistence of earlier expectations and by the influence of absence. Those who are absent more often do not hold as high expectations. The causal direction here is not clear however--children who are absent might believe that absence would undermine their chance of doing well, or those with little commitment to school could decide to absent themselves more often. Absence also impacts on reading marks and arithmetic marks. Other information on absence are required to disentangle the causal process.

Parents' expectations had some impact on first marks and such an effect is manifest on reading marks at the end of the year also. ABIL, which had no noticeable effects on earlier marks, does connect to reading marks by the end of the year.

FIGURE 6.21

Model for T2, Integrated Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E R1
E A1
E C1
M R1
M A1
M C1
PE R1
PE A1
PE C1
ABIL 1
PEER 2
ABS 2
RACE
.20
.28
.48
.78
.20
.45
.25
.01α
.005
.26
.43
.20
.66
.01
.01
.16
1.00
.01
.30
.34
.29
E R2
E A2
E C2
(12%)
(15%)
(17%)
M R2
M A2
M C2
(76%)
(64%)
(64%)

[α] In subsample replications the sign of this coefficient was inconsistent.

Peer ratings impact in reading marks and conduct marks. Peers appear to be about as influential as parents.

In the first cycle children's initial expectations did not connect to first marks. Those initial expectations do connect to year-end marks in both reading and arithmetic (paths from E_{R1} to M_{R2} and E_{A1} to M_{A2}). This is a peculiar pattern not seen elsewhere in the models for this school. Since expectations later in first grade do not impact on marks, we think it best to leave these paths without further comment.

The model accounts very well for children's marks in all three areas. In fact the coefficients of determinancy associated with marks (76%, 64%, and 64%) are very high. They seem to be caused mainly by the persistence of marks given earlier, especially in reading, but children's expectations, peer ratings and absence play some role. In addition conduct is influential in determining both reading and arithmetic performance. Since earlier conduct marks responded to sex and to IQ, and since later conduct marks respond to earlier conduct marks, the influence of the child's deportment on his proficiency in the academic areas appears substantial. Those with higher IQ's are judged to be better behaved, and those who are better behaved are judged to be better in reading and arithmetic.

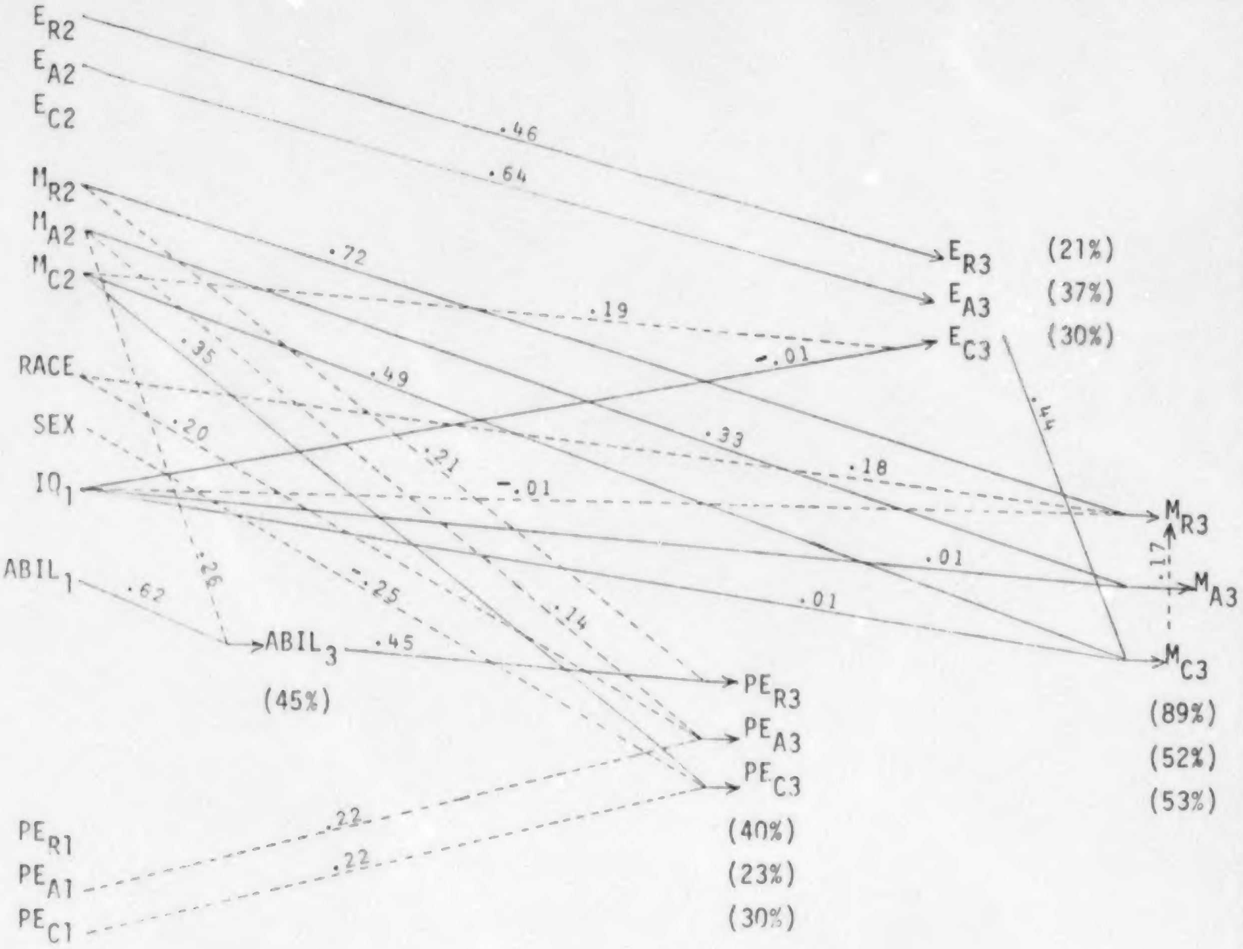
The absence of paths from initial marks to year-end expectations suggests that feedback from first marks is not processed in forming expectations. Since earlier expectations persist, there is evidence that expectations are not random, but to this point sex and absences are the only variables in the model which account for them.

Figure 6.3I

With a new teacher, we see no direct effect of sex, and a small bias

FIGURE 6.3I

Model for T3, Integrated Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E R2
E A2
E C2
M R2
M A2
M C2
RACE
SEX
IQ 1
ABIL 1
PE R1
PE A1
PE C1
.46
.64
.72
.19
-.01
.35
.49
.20
.21
.33
.18
-.01
.01
.01
.28
.62
.25
.14
.45
.22
.22
.44
.17
E R3 (21%)
E A3 (37%)
E C3 (30%)
M R3
M A3
M C3
(89%)
(52%)
(53%)
ABIL 3
(45%)
PE R3
PE A3
PE C3
(40%)
(23%)
(30%)

(0.19 grade points) favoring whites in reading marks. IQ, however, appears influential on conduct once again, and impacts arithmetic but not reading.

$ABIL_3$ is affected by the earlier ABIL estimate and in addition by the child's earlier marks in arithmetic.

It is surprising that there is so little persistence in parents' expectations for reading, although the cause may be the information acquired by the parents as a consequence of the child's first-grade performance--the parent's expectation in second grade responds to the child's first grade marks in both reading and conduct. In contrast with first grade however, parents' expectations do not affect subsequent variables in the model.

Children's expectations are noticeably better determined (21%, 37% and 30% vs. 12%, 15% and 17%) but again we call attention to the lack of connections between prior marks and current expectations except for conduct. There are no paths linking M_{R2} and M_{A2} to E_{R3} and E_{A3}. IQ affects children's expectations in conduct.

Children's marks in reading are better accounted for than ever before--in fact almost completely accounted for. Prior reading marks and IQ hold the key. Children's expectations and parents' expectations play a negligible role. The conclusion seems inescapable that the school (teachers) is determining academic performance levels.

Here deportment, as signified by mark in conduct, affects reading, not arithmetic. As already remarked, the conduct mark is affected both directly and indirectly by IQ--indirectly via children's expectations--so some small response may be attributable to "child" factors but not much. Likewise the arithmetic mark is almost entirely dependent on the previous mark and IQ.

Figure 6.4I

The second half of grade two continues some patterns we have seen before, namely that peers affect marks (in this case in arithmetic and conduct) and absences affect children's expectations in two areas and marks in two areas. There is one path from previous marks to current expectations (borderline for arithmetic) and considerable persistence in expectations from the third to the fourth cycle. The determinacy in expectations declines over the year, a puzzling outcome (and one that repeats itself within third grade also).

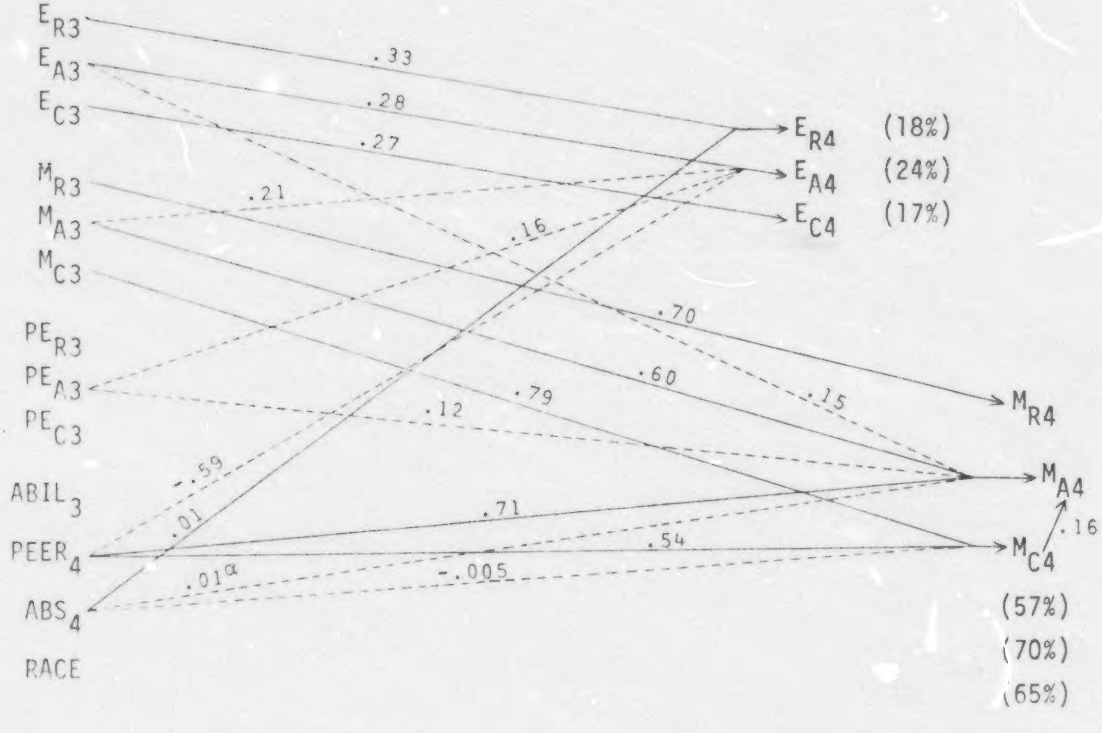
Parents' expectations for arithmetic affect both children's expectations and marks in that area. There are no paths from children's expectations at the end of the year to their year-end marks, but again strong effects or mark persistence over the year. In fact up to this point there has been strong persistence in marks in every cycle. Again here we see marks well-determined although the reading mark is less well determined than the other two marks. Also again a part of the arithmetic mark can be "explained" by conduct.

Figure 6.5I

The poor fit of this model was discussed earlier. The structure, despite the poor fit, is much like structures of earlier cycles. Race has no discernible effects. Both sex and IQ affect children's expectations. (Earlier, similar effects were found although not together in any one cycle.) Furthermore sex effects are in a predictable direction--

FIGURE 6.4I

Model for T4, Integrated Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)

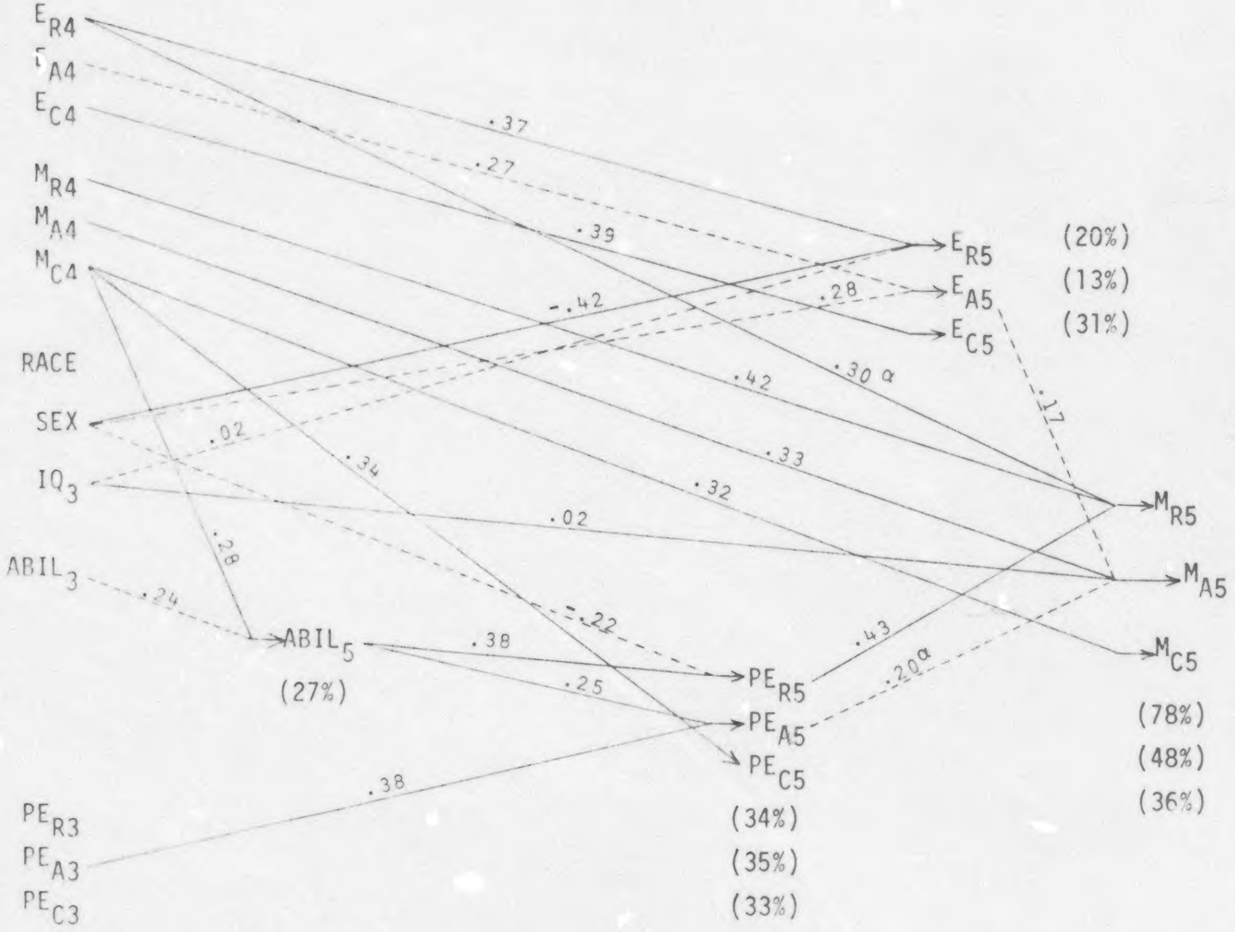


E_{R3}
E_{A3}
E_{C3}
M_{R3}
M_{A3}
M_{C3}
PE_{R3}
PE_{A3}
PE_{C3}
$ABIL_3$
$PEER_4$
ABS_4
RACE
.33
.28
.27
.21
.16
.70
.60
.79
.15
.12
-.59
.01
.71
.54
.01^α
-.005
.16
E_{R4} (18%)
E_{A4} (24%)
E_{C4} (17%)
M_{R4}
M_{A4}
M_{C4}
(57%)
(70%)
(65%)

[α] In subsample replications the sign of this coefficient was inconsistent.

FIGURE 6.5I

Model for T5, Integrated Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E_{R4}
E_{A4}
E_{C4}
M_{R4}
M_{A4}
M_{C4}
RACE
SEX
IQ_3
$ABIL_3$
$ABIL_5$
(27%)
PE_{R3}
PE_{A3}
PE_{C3}
.37
.27
.39
-.42
.28
.30 α
.42
.17
.02
.34
.33
.32
.02
.28
.24
-.22
.38
.25
.43
.20α
.38
E_{R5}
E_{A5}
E_{C5}
(20%)
(13%)
(31%)
M_{R5}
M_{A5}
M_{C5}
(78%)
(48%)
(36%)
PE_{R5}
PE_{A5}
PE_{C5}
(34%)
(35%)
(33%)

[a] In subsample replications the sign of this coefficient was inconsistent.

girls expect to do better in reading, boys in arithmetic. IQ has strong effects on both expectation for reading and reading marks. Each time IQ is introduced anew as an exogenous variable at the start of each school year, we observe that it does affect marks. Previous marks are influential but each teacher is apparently affected afresh by the IQ measure.

Again parents' expectations affect marks but surprisingly neither parents ABIL estimates nor their specific expectations at the beginning of grade three are responsive to marks given at the end of grade two. (In grade two there was some effect of grade one performance on both ABIL and parents' expectations in reading). Parents' expectations do not connect to children's expectations.

Effects of Sex and IQ on children's expectations have already been mentioned. Aside from these two variables, the only other input to children's expectations is their expectations at the immediately prior time--persistence again. Here too, paths from previous marks to children's expectations are absent.

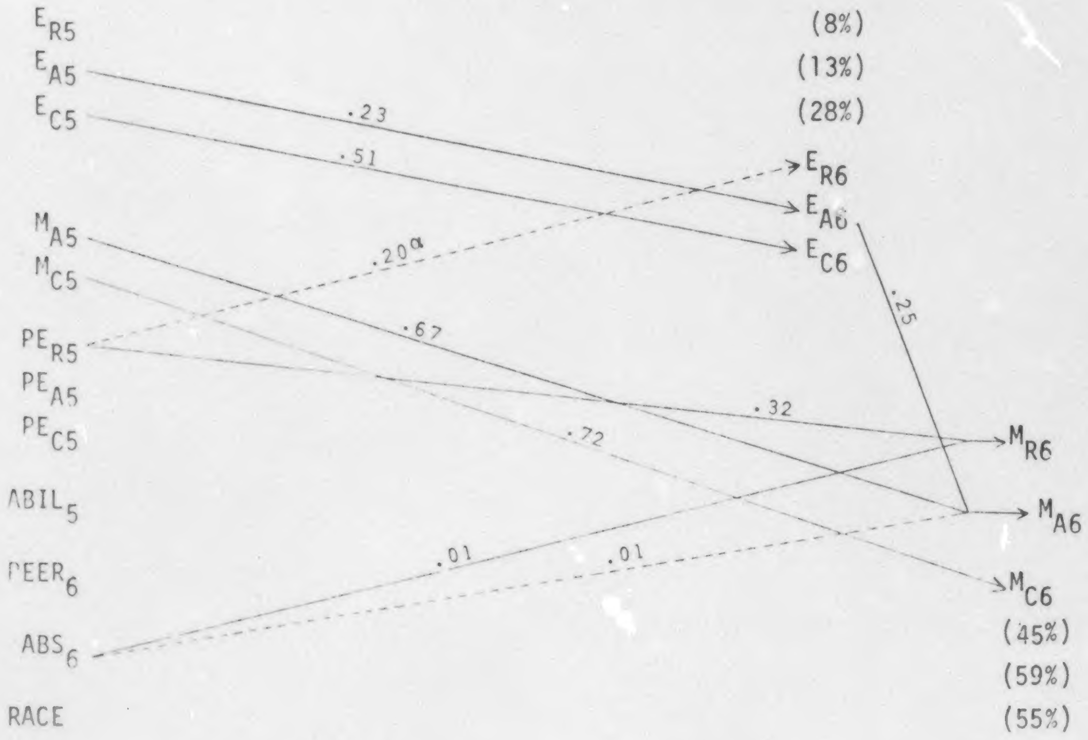
Again reading marks display a high level of determinacy. The coefficient of persistence reading marks is somewhat smaller (.42) than in any other cycle (they range above .70), but we suspect that this relatively low coefficient should be ignored, because M_{R5} had to be deleted to get any estimates at all. There is a relatively low level of determinacy for the mark in conduct and for the first time it does not link to performance in the two academic areas. For the first time, however, children's expectations in the two academic areas impact on marks.

Figure 6.61

This model is remarkable mostly because it repeats certain connections

FIGURE 6.6I

Model for T6, Integrated Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)


E_{R5}
E_{A5}
E_{C5}
M_{A5}
M_{C5}
PE_{R5}
PE_{A5}
PE_{C5}
$ABIL_5$
$PEER_6$
ABS_6
RACE
(8%)
(13%)
(28%)
E_{R6}
E_{A6}
E_{C6}
.23
.51
.20$^{\alpha}$
.67
.25
.32
.72
.01
.01
M_{R6}
M_{A6}
M_{C6}
(45%)
(59%)
(55%)

$^{\alpha}$In subsample replications the sign of this coefficient was inconsistent.

NOTE: Inversion of this matrix required deleting M_{R5}.

noted in previous cycles--the influence of absence on reading and arithmetic performance (seen in grade one), the persistence of expectations (seen in most prior cycles), and of marks (seen in all prior cycles), and the absence of paths from marks to subsequent children's expectations. For some reason that is not clear the determinacy in children's expectations falls off. The determinacy in marks (55%, 59%, and 55%) is about what would be expected, given that mid-year reading mark was not estimated. No doubt parents' expectation is picking up some of this although the parents' expectation did not respond to earlier mark feedback.

Summary for Figures 6.1I to 6.6I

There are several general conclusions to draw about this set of models.

First, there is a complete lack of effects associated with race except two at the start that seems anomolous . The effect of IQ on marks is repeatedly manifest and is probably the chief explanation for the high degree of determinacy in marks in this school. Marks do have a strong tendency to persist from the beginning to the end of every cycle, but in addition IQ continues to exert direct effects even as late as grade three. The contribution of absences, IQ, and sex to children's expectations stands in bold relief compared to the complete lack of mark effects on expectations.

Expectations affect marks at the same time in several cycles, although this influence is not entirely consistent. Marks never seem to have any impact on expectations. These children seem to ignore feedback from marks. In second grade parents seem attend to previous marks in forming their expectations, but not in third grade. Parents' expectations affect children's expectations in only a single instance, for reading at the end of grade three. Since there are many opportunities for parents' expectations, including ABIL, to affect children's expectations, but such a link appears only once, and since children's expectations never affect parents' expectations, we must conclude that these two actors go along oblivious of one another's outlook.

Lower-Class Black School

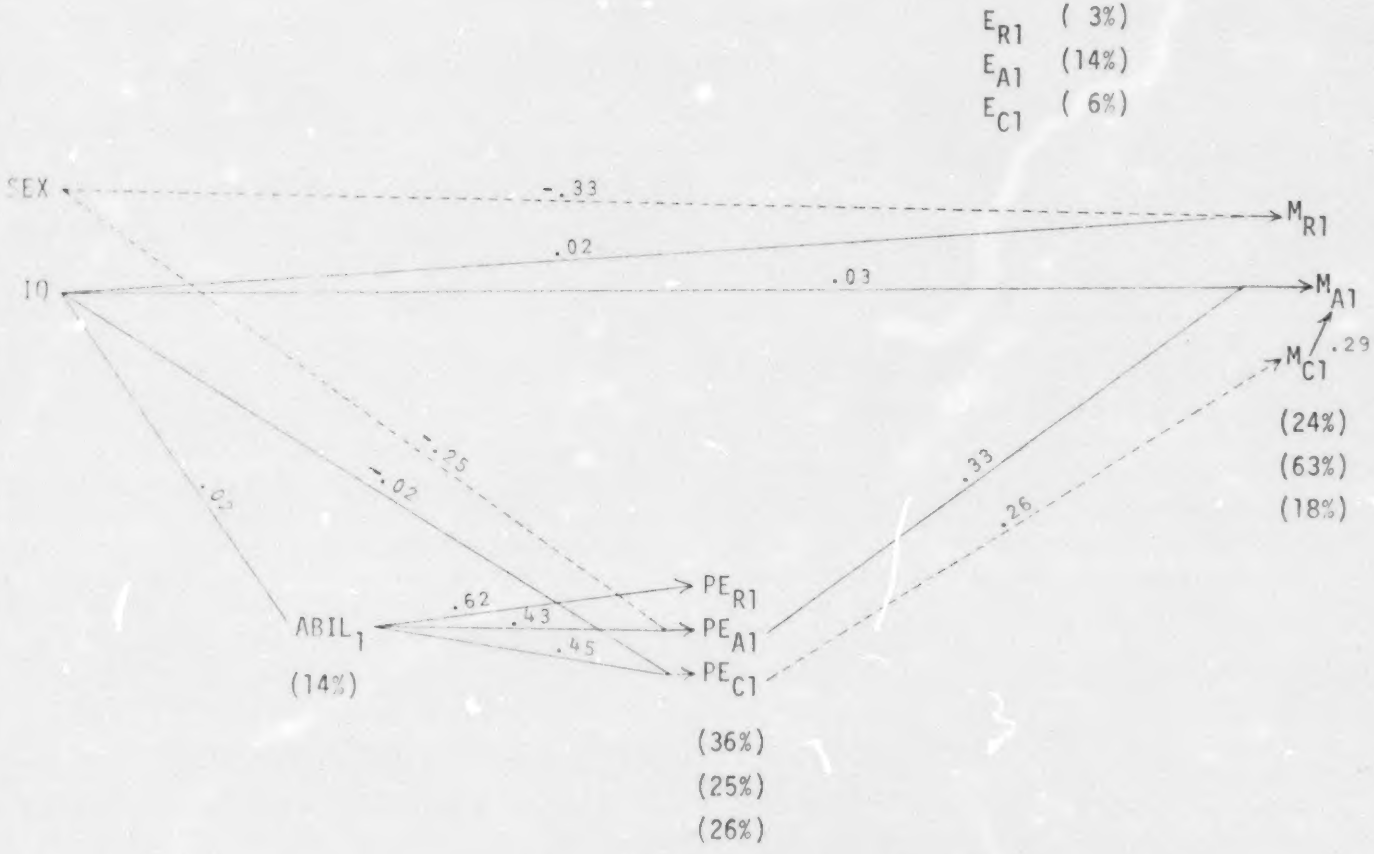
Figures 6.1B to 6.6B refer to the lower class black school where socioeconomic characteristics of the neighborhood and of children's parents strongly resemble those of the lower-class integrated school. Since we did not find effects owing to race in the integrated school where whites and blacks were roughly matched for social class, if models in this school diverge from others we suspect social class rather than race is the more likely explanation. The data base for this school was not large enough to permit even-odd replication analyses so the findings for this school are weaker in two respects: they cannot be scrutinized in terms of internal consistency, and with a smaller number of persons in the sample, the parameters are naturally less well determined. In particular Type II errors may be more likely here. This point will be elaborated in the later discussion when models are compared across schools. Also because of a singular matrix we could not get estimates for the third cycle model for this school (Figure 6.3B).

Figure 6.1B

Sex directly affects marks in reading in the expected direction--

FIGURE 6.1B

Model for T1, Black Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E R1 (3%)
E A1 (14%)
E C1 (6%)
SEX
-.33
M R1
.02
IQ
.03
M A1
M C1
.29
(24%)
(63%)
(18%)
.02
-.02
-.25
.33
.26
ABIL 1
(14%)
.62
.43
.45
PE R1
PE A1
PE C1
(36%)
(25%)
(26%)

girls do better than boys. Sex also affects parents' expectations for arithmetic in the same direction.

IQ has large effects on marks in both reading and arithmetic. It is also a determinant of ABIL and directly of parents' expectations for conduct, but the relation between IQ and parents' expectations for conduct is inverse. We have no opportunity to check this finding further, and will not discuss it because it is isolated and counterintuitive.

ABIL, as usual, predicts parents' expectations in all three areas. Parents' expectations in reading are better determined than in arithmetic or conduct (36% vs. 25% and 26%).

Children's initial expectations are about as well determined--or undetermined--as we have come to expect. In this model there are no connections leading to or from children's expectations, however, perhaps a consequence of the small sample size.

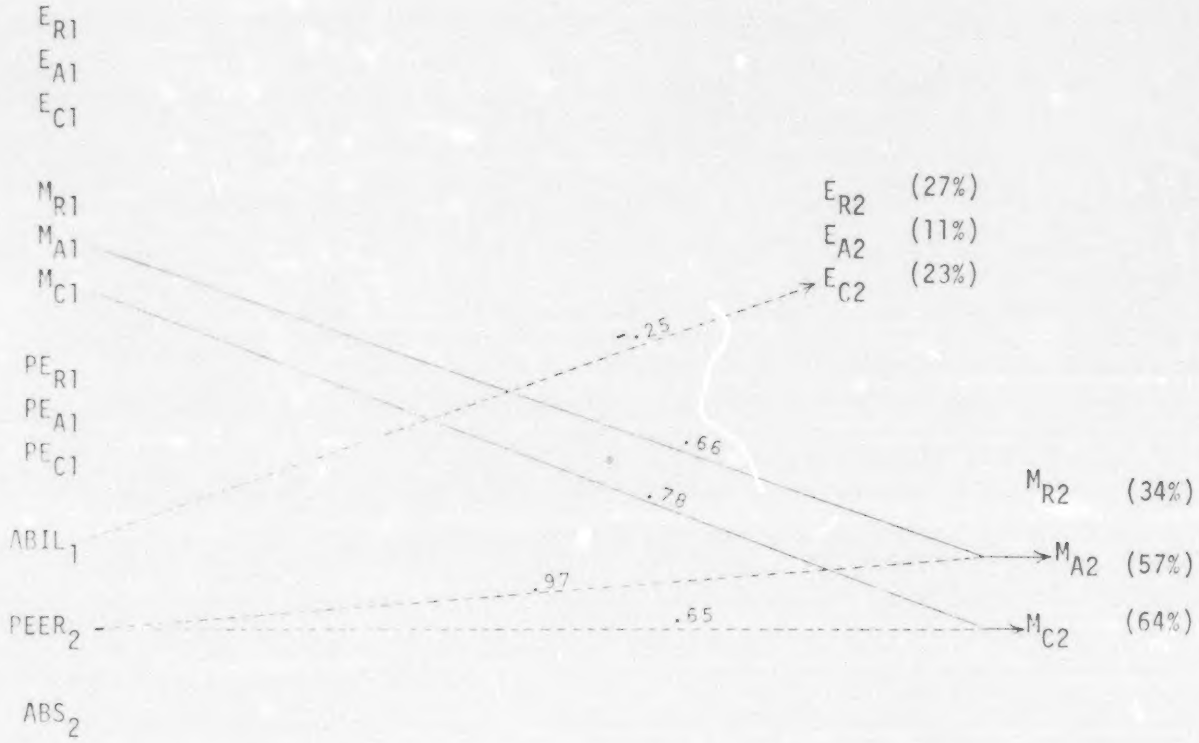
The determinacy of marks varies widely from 63% for arithmetic marks to 18% for conduct. The conduct mark explains some portion of the arithmetic mark, but in terms of coefficients we have seen previously, IQ here must be seen as the main determinant of marks in reading and is even more influential as a determinant of arithmetic marks. Parents' expectations, however, are also important for arithmetic and probably explain why arithmetic is so well-determined.

Figure 6.2B

This model has few paths--notably neither expectations in reading nor reading marks persist. Furthermore, the value of the coefficient linking M_{R1} to M_{R2} is not even close to significance. Its value, 0.2, is far lower than the coefficients linking the other two marks (.66 and

FIGURE 6.2B[a]

Model for T2, Black Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error (Determinacy in Parentheses)



E_{R1}
E_{A1}
E_{C1}
M_{R1}
M_{A1}
M_{C1}
PE_{R1}
PE_{A1}
PE_{C1}
$ABIL_1$
$PEER_2$
ABS_2
E_{R2} (27%)
E_{A2} (11%)
E_{C2} (23%)
-.25
.66
.78
.97
.65
M_{R2} (34%)
M_{A2} (57%)
M_{C2} (64%)

---

[a] There is no Figure 6.3B because the covariance matrix was singular and the model could not be estimated.

.78 for arithmetic and conduct, respectively). The conclusion must be that, within the first-grade year, marks are highly unstable. With the general absence of connections in this model, it is all the more remarkable that peer ratings link to marks in both conduct and arithmetic.

The negative coefficient between parents' estimate of ability and children's expectations in conduct is reminiscent of findings in the middle-class school--when parents hold high expectations' the child may be threatened.

All told, the reading mark is poorly explained in relative terms (34% vs. 57% and 64%) and appears refractory to a number of influences observed to affect it in the other schools.

Figure 6.3B

This model could not be estimated.

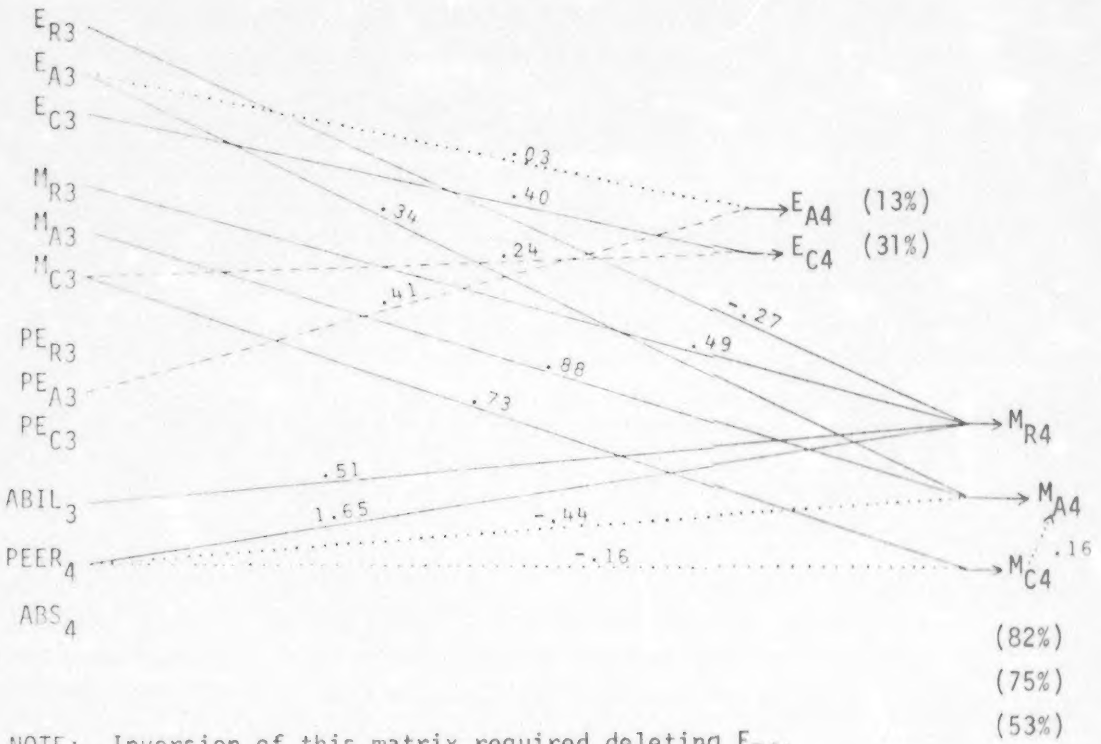
Figure 6.4B

In this model to invert the matrix it was necessary to delete E_{R4}. Also in this model and later models for this school some coefficients are shown which are not 1.5 times their standard errors or greater, so that an easy comparison is possible between the figures for this school and corresponding figures for the integrated school. In every case where a coefficient was large in the integrated school, that same coefficient was put in Figures 6.3B to 6.6B whether or not it met the standards for size.

Children's expectations in arithmetic, in contrast to what was noted for the other school, do not persist, although conduct expectations do. Children's expectations for arithmetic are responsive only to parental expectations, and children's expectations for conduct respond to previous conduct marks.

FIGURE 6.4B

Model for T4, Black Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error; (···) Indicate Structural Coefficients that Were 2 or More Times Their Standard Error in the Integrated School (Determinacy in Parentheses)



E_{R3}
E_{A3}
E_{C3}
M_{R3}
M_{A3}
M_{C3}
PE_{R3}
PE_{A3}
PE_{C3}
$ABIL_3$
$PEER_4$
ABS_4
.03
.40
.34
.24
.41
-.27
.49
.88
.73
.51
1.65
-.44
-.16
.16
E_{A4} (13%)
E_{C4} (31%)
M_{R4}
M_{A4}
M_{C4}
(82%)
(75%)
(53%)

NOTE: Inversion of this matrix required deleting E_{R4}.

In contrast with expectations, marks are very well accounted for. There are strong persistence effects particularly for arithmetic and conduct. Parents and peers are also influential for reading marks. Other marks respond to peer ratings, but in a negative direction. The influence of the conduct mark on the arithmetic mark is about what we have seen in other models. The lagged coefficients between expectations in reading and arithmetic are opposite in sign and the one for reading is difficult to interpret sensibly.

The main conclusions are that both parents and peers are influential for reading, that persistence and the child's expectations are important for arithmetic, and that conduct marks are accounted for mainly by persistence.

Figure 6.5B

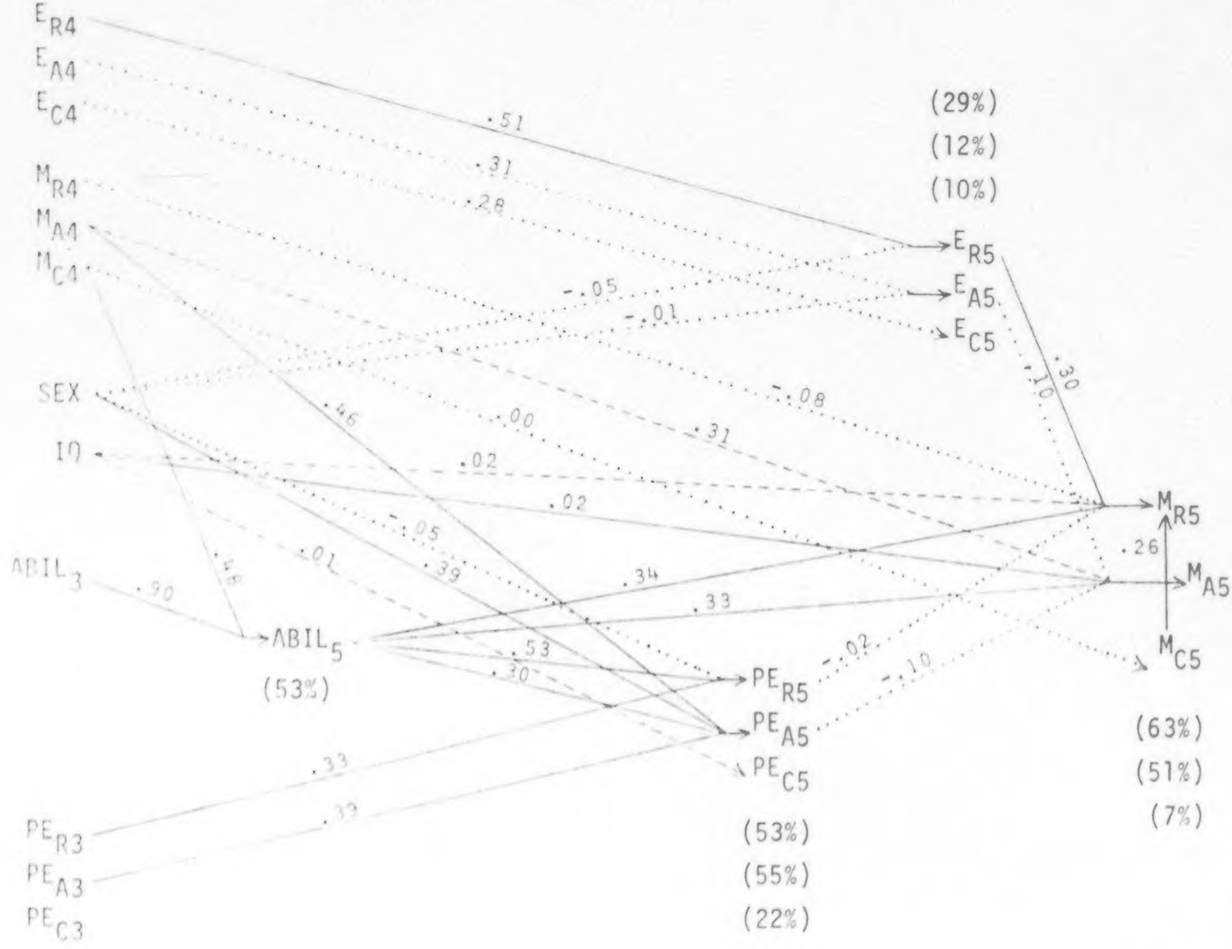
The fit for this model is not good. Again paths corresponding to significant paths in Figure 6.5I are shown even though not large enough to reach our standard criterion.

IQ has sizeable direct effects on marks in both reading and arithmetic, about as large in absolute terms as most similar coefficients based on IQ.

Parents' expectations in conduct are not at all well determined, and do not respond even to parental conduct expectations reported in the previous grade. Parents are influential, however, on both reading and arithmetic marks and together with IQ account for the rather high degree of determinacy in these marks.

FIGURE 6.5B

Model for T5, Black Lower-Class School, Showing Structural Coefficients 1.50 to 1.99 Times (---) or 2.00 or More Times (——) Their Standard Error; (···) Indicate Structural Coefficients that Were 2 or More Times Their Standard Errors in the Integrated School (Determinacy in Parentheses)


E_{R4}
E_{A4}
E_{C4}
M_{R4}
M_{A4}
M_{C4}
SEX
IQ
$ABIL_3$
$ABIL_5$
(53%)
PE_{R3}
PE_{A3}
PE_{C3}
.51
.31
.28
-.05
-.01
-.08
.00
.31
.46
.02
.02
-.05
.01
.39
.48
.90
.34
.33
.53
.30
.33
.33
(29%)
(12%)
(10%)
E_{R5}
E_{A5}
E_{C5}
.30
.10
M_{R5}
.26
M_{A5}
M_{C5}
PE_{R5}
PE_{A5}
PE_{C5}
-.02
-.10
(63%)
(51%)
(7%)
(53%)
(55%)
(22%)

There is not much persistence in marks between second and third grades. The significance of this finding is hard to evaluate since we do not have information for this school on persistence in marks between first and second grades.

Children's expectations for reading persist from the end of second grade to the beginning of third grade. Furthermore, children's expectations for reading are a significant influence upon marks in reading.

Conduct marks are very poorly accounted for, but they do have impact on reading performance.

This figure is a difficult one to summarize--failures in mark persistence and the lack of determinacy in conduct marks prevent its ready comparison with other figures for this school or with the corresponding figures in the other two schools.

Figure 6.6B

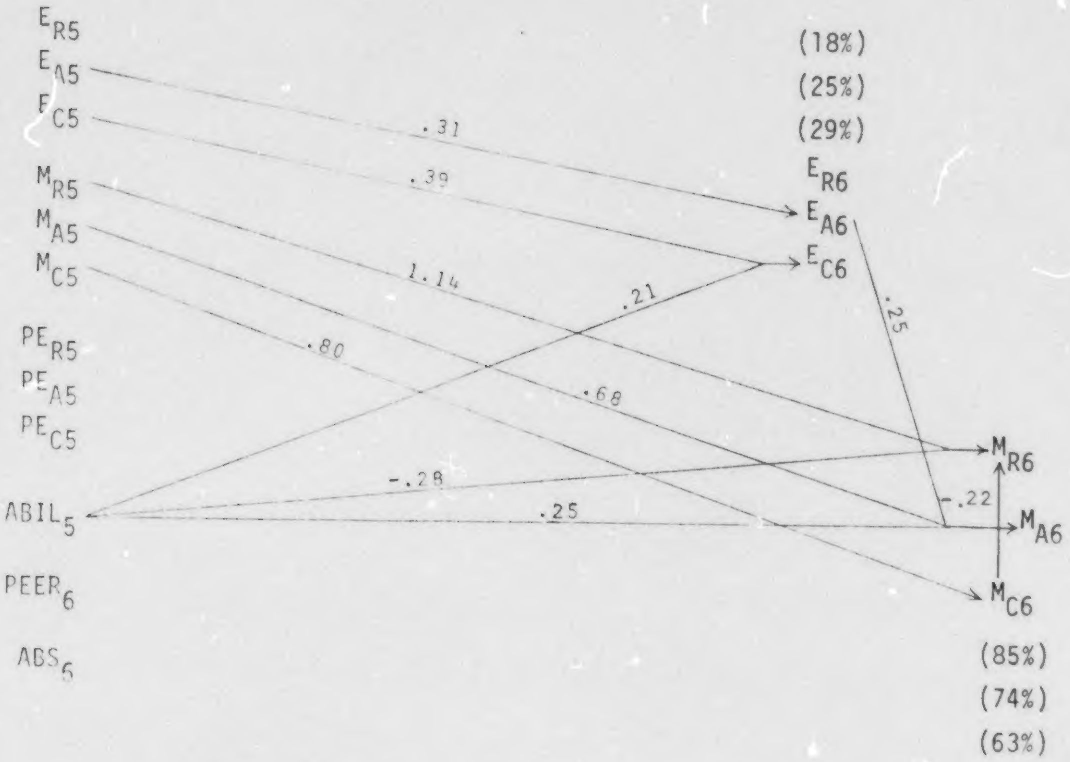
In contrast with the previous figure, here children's reading expectations do not persist. Also in contrast with the previous figure, marks in all three areas show strong persistence and are highly determined.

The coefficient linking parents' ability estimates to marks in reading is negative, while the coefficient between ABIL and children's arithmetic marks is positive. The negative coefficient seems ananalous. Without even-odd replications for this school, we cannot check internal consistency, but coefficients linking ABIL to marks in reading and arithmetic were positive in both preceding cycles. Therefore we will not discuss the negative coefficient.

Children's conduct expectations respond to ABIL.

FIGURE 6.6B

Model for T6, Black Lower-Class School, Showing Structural Coefficients 2.00 or More Times Their Standard Error (Determinacy in Parentheses)



E_{R5}
E_{A5}
E_{C5}
M_{R5}
M_{A5}
M_{C5}
PE_{R5}
PE_{A5}
PE_{C5}
$ABIL_5$
$PEER_6$
ABS_6
(18%)
(25%)
(29%)
E_{R6}
E_{A6}
E_{C6}
.31
.39
1.14
.21
.25
.80
.68
-.28
.25
-.22
M_{R6}
M_{A6}
M_{C6}
(85%)
(74%)
(63%)

Children's arithmetic expectations influence marks in arithmetic, and the conduct mark is the only notable influence on the reading mark aside from persistence.

The absence of links from marks to expectations continues a pattern seen throughout in this school, (one mild exception in the fourth cycle).

By the end of grade three, familiar structures appear in the model. First there is some persistence in expectations, and the degree of determinacy in children's expectations is roughly what we have come to expect. Unlike the integrated school, here we find peers and absences do not have paths of sufficient size to appear in the figure, but the magnitudes are consistent with those found in the integrated school.

Review of Effects, Variable by Variable

The preceding section reviewed the longitudinal picture for development of young children's expectations and achievement. The discussion proceeded on the basis of structural coefficients that were 1.5 times their standard errors or larger and consistent in sign between subsample replicates. The longitudinal summary provided a useful perspective on the general reasonableness of the models and the possible influence of cultural context--results for each school were summarized separately. In this section we approach the data from another vantage point, the efficacy of particular variables. In this section we will give a complete summary of structural coefficients regardless of size for every variable as estimated from the full data set. This will highlight substance more than structure and offer the reader a means for easily evaluating relative potency of variables irrespective of sampling variability.

Exogenous Variables

Effects Associated with IQ

IQ appears as an exogenous variable at the start of every school year because each teacher may take IQ into account in a different way. Also parents may pay varying attention to IQ--for example they may pay attention in second grade when they have not paid attention in first grade if they learn their child's IQ score in the interim.

Apparently IQ influences parents' earliest expectations. Its influence, furthermore, is not confined to the first year. Parents repeatedly readjust their expectations in light of the child's IQ. To the extent it is determined, the pattern over the third grade looks much the same from school to school.

Concerning the impact of IQ on children's expectations, the coefficients for the middle-class school appear somewhat larger than for the other two schools and are sometimes negative rather than positive. In fact, when viewed all together in Table 6.3, the coefficients associated with IQ suggest contrary to our earlier opinion (Entwisle and Hayduk, 1978) that middle-class children do indeed use IQ information in constructing their expectations. The children, of course, do not know their own IQ scores, but it is likely that they receive clues from parents and teachers if they are "really smart". The negative link between IQ and expectations could imply that brighter children are held to tougher standards, or that less-bright children are less realistic in their expectations.

Marks respond more strongly to IQ over all three grades in the two lower-class schools. In the middle-class school marks seem less responsive at the start, but in second and third grades, the influence

Table 6.3

Summary of Structural Coefficients Associated with IQ

Endogenous Variables		T1	T3	T5
ABIL	White Middle-Class School	.050*	.021*	-.002
	Integrated Lower-Class School	.022*	-.008	.001
	Black Lower-Class School	.019*	-	-.009
PE_R	White Middle-Class School	.011	-.001	.005+
	Integrated Lower-Class School	.011*	-.004	.010
	Black Lower-Class School	-.004	-	.006
PE_A	White Middle-Class School	.022*	-.006	.006+
	Integrated Lower-Class School	.011*	.000	.010
	Black Lower-Class School	-.005	-	-.008
PE_C	White Middle-Class School	.007	-.023*	.003
	Integrated Lower-Class School	.001	-.003	.005
	Black Lower-Class School	-.020*	-	.013+
E_R	White Middle-Class School	.010	-.016+	-.011*
	Integrated Lower-Class School	.004	-.010	.018+
	Black Lower-Class School	.003	-	.004
E_A	White Middle-Class School	.022*	.001	.000
	Integrated Lower-Class School	.006	-.004	-.006
	Black Lower-Class School	-.013	-	.001
E_C	White Middle-Class School	-.009	-.018+	-.007
	Integrated Lower-Class School	.001	-.015*	.001
	Black Lower-Class School	-.001	-	.000
M_R	White Middle-Class School	.001	.010	.007+
	Integrated Lower-Class School	.030*	-.011+	.008
	Black Lower-Class School	.023*	-	.018+
M_A	White Middle-Class School	.008	.013+	-.001
	Integrated Lower-Class School	.015*	.013*	.020+
	Black Lower-Class School	.033*	-	.017+
M_C	White Middle-Class School	.016+	.016+	.006
	Integrated Lower-Class School	.012+	.014*	.007
	Black Lower-Class School	.006	-	.004

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

of IQ in the middle-class school seems more substantial. This observation confirms our earlier less analytic analysis (Entwisle and Hayduk, 1978).

Teachers in the middle-class school are supposed to reward effort. Teachers in the other two schools are supposed to focus on grade-level performance norms. As we noted earlier, either policy may be harder and harder to implement as children continue in school. That is, after children have attained some proficiency in reading, it may be impossible to reward with A's a high level of effort coupled to a poor performance, or to give B's or C's to children who read well but who seem not to exert as much effort. By the same token, if children are not performing at an A or B level, if the teacher ignores effort and grades all poor performers the same regardless of effort, learning may be discouraged.

Effects Related to Race

Table 6.4 summarizes the structural coefficients linking race to the full set of endogenous variables present in any cycle of the model.

Effects on parent variables are fairly large in three instances (parents T1 expectations for conduct, parents' T3 expectations for arithmetic and parents; T5 expectations for reading), but difficult to interpret because blacks have higher conduct expectations and lower arithmetic expectations. For parents effects owing to race appear erratically, but can be large.

Effects of race on children's expectations or marks appear small with the possible exception of marks in reading. (With 30 parameters estimated we would expect at least one coefficient to exceed twice its

Table 6.4

Race Effects
(Lower-Class Integrated School)

Endogenous Variables	T1	T2	T3	T4	T5	T6
ABIL	-.005		.065		-.121	
PE_R	-.089		.106		-.175	
PE_A	.001		.202†		-.123	
PE_C	.187*		.049		-.015	
E_R	-.002	-.068	.104	.009	-.099	.158
E_A	-.041	.053	-.113	.015	-.180	.041
E_C	.041	-.029	-.058	.108	-.049	.009
M_R	-.206*	-.019	.177†	-.044	-.016	.153
M_A	-.070	.105	.114	.083	.064	.024
M_C	.004	.112	.085	.113	.009	.102

*Coefficient more than twice its standard error.

†Coefficient more than 1.5 times its standard error.

standard error, so we are inclined to ignore this exception). At the beginning of both first and second grades there are fairly large effects on reading marks: for first grade -.21 and significant, for second grade .18 and borderline. Since different sets of teachers are involved in successive years, it appears likely that race can bias teachers' evaluations in reading but that the bias occurs so as to favor whites _or_ blacks.

Altogether effects associated with race appear negligible or potentially offsetting. In the integrated school background factors and teacher factors are fairly constant across race. Between-school race effects (middle class white vs. lower class black) cannot be evaluated realistically because race is confounded with residential locus, SES, and other school differences. But whites within the integrated school resemble blacks in that school more than whites in the suburban school. Also the differences between blacks in the integrated school and in the all-black school are relatively smaller than differences between whites in the integrated school and whites in the middle-class school, so we believe that SES or social class is more likely than race per se as an explanation for differences between schools.

Effects Associated with Sex

In contrast with race, effects associated with sex could be checked in every school. Sex was introduced repeatedly as an exogenous variable because we expected that the child's sex might affect the marking practices of different teachers to different degrees. Also as children have continuing exposure to school, they might pick up more and more information about sex role expectations. A similar phenomenon for sex role expectations could operate for parents as well.

The first conclusion from Table 6.5 is that being female is associated with more positive parents' estimates when children start school. Although this trend is relatively large only for middle-class parents' conduct expectations, it is also hinted at elsewhere. Being female also seems to make a child's own expectations higher initially. Being female is conducive to better initial marks in conduct in two of the three schools. With the single near exception of the black segregated school in first grade, however, sex biases in reading or arithmetic marks appear, on the surface at least, to be absent. This is a finding worth notice for it implies that the slight bias in parents' expectations favoring girls does not have a noticeable direct effect on teacher's marks in the two academic areas, nor do teachers favor one sex over the other without regard to anything else. On the other hand, since conduct is conceptualized as a carrier for reading and arithmetic achievement, bias may be stronger than is implied by first-order effects. Specifically, the first grade coefficients of -.27 x .26 (middle class), -.40 x .27 (integrated) linking sex to conduct marks and then conduct marks to reading marks (with both coefficients in each case exceeding twice their standard errors) indicate that sex does affect conduct performance and therefore reading or arithmetic achievement subsequently. There is a similar chain of effects in the middle-class school to initial arithmetic marks (-.27 x .14). The magnitude of these chained effects is very small, however.

The child's conduct mark, which shows substantial effects on other marks in almost every cycle, reveals that boys more often than girls exhibited poor deportment. The bias in conduct marks favoring girls is

Table 6.5

Sex Effects

Endogenous Variables		T1	T2	T3	T4	T5	T6
ABIL	White Middle-Class School	-.100		.274*		-.111	
	Integrated Lower-Class School	-.146†		.141		.077	
	Black Lower-Class School	-.190				.220	
PE_R	White Middle-Class School	-.081		-.004		-.114†	
	Integrated Lower-Class School	-.162†		-.110		-.221†	
	Black Lower-Class School	-.170				-.054	
PE_A	White Middle-Class School	.095		.030		.215*	
	Integrated Lower-Class School	-.126		.017		-.107	
	Black Lower-Class School	-.248†				.392*	
PE_C	White Middle-Class School	-.195*		.005		.028	
	Integrated Lower-Class School	-.166†		-.251†		-.070	
	Black Lower-Class School	-.170				-.056	
E_R	White Middle-Class School	-.016		-.093		-.052	
	Integrated Lower-Class School	-.236*		.022		-.418*	
	Black Lower-Class School	.021				-.049	
E_A	White Middle-Class School	.032		.068		.115	
	Integrated Lower-Class School	-.024		.038		.281†	
	Black Lower-Class School	-.110				-.010	
E_C	White Middle-Class School	-.305*		-.078		.008	
	Integrated Lower-Class School	-.050		.005		-.085	
	Black Lower-Class School	-.002				-.086	
M_R	White Middle-Class School	.013		-.056		-.020	
	Integrated Lower-Class School	-.017		-.030		.030	
	Black Lower-Class School	-.325†				.194	
M_A	White Middle-Class School	.052		.080		-.048	
	Integrated Lower-Class School	.027		-.013		.064	
	Black Lower-Class School	-.015				.101	
M_C	White Middle-Class School	-.266†		-.059		-.174†	
	Integrated Lower-Class School	-.404*		.028		-.011	
	Black Lower-Class School	-.166				-.193	

*Coefficient more than twice its standard error.

†Coefficient more than 1.5 times its standard error.

consistent (7 of 8 instances), although largest at the start of first grade.

In first grade parents' expectations favor girls in all areas (ABIL and PE have negative coefficients with one exception, and are close to significance in several instances). Patterns for second grade are not clear. By third grade there is an interesting differentiation--parents of girls are inclined to hold higher expectations for reading, while parents of boys hold higher expectations for arithmetic. The coefficients in the middle-class school are more consistent than those in the other two schools, suggesting that the prevalence of sex role stereotypes is no less among middle class than lower class parents.

Only in the integrated school is there any evidence of a sex bias in children's own expectations (for reading).

All in all, effects attributable to sex are numerous, in some cases substantial, and in first grade probably efficacious. Differences among the three schools that might reflect sex role stereotypes linked to class are not visible. At the beginning of school girls appear to hold an edge both in terms of their parents hopes' and also to a lesser degree because of their own expectations. Teachers appear resistant to unmitigated sex favoritism but the child's sex indirectly affects early achievement in both reading and arithmetic either because the child's conduct (which is sex-related) colors the teacher's evaluation of performance in the two academic areas, or because poor deportment actually interferes with learning. Later when we examine data for standardized achievement it may be possible to choose between the two explanations.

Effects Associated with Peer Ratings

Peer ratings were obtained each year in the second semester. As

Table 6.6 shows, in first and second grades there are some coefficients linking peer ratings to marks in all schools. Apparently, when peers make a high or low appraisal of a classmate, there is a tendency for teachers to do the same, all other things held constant. In third grade the picture is not as clear.

Altogether the influence of peer ratings on children's expectations appears negligible. Signs are mixed and inconsistent both within school and within subject matter areas and there is certainly no evidence that peers are more influential in one school as compared to another. The lack of any sizeable coefficients in third grade is troubling. It could signify that the peer ranking measure is less valid as children grow older. All in all, these data are inconclusive and there is need for further research on peer ratings and expectations.

Effects Associated with Absence

Most of the large effects of absence are found in the integrated school. Eleven of the thirteen effects that are 1.5 or more times their standard errors are noted for the integrated school. (However, since two of these eleven coefficients did not replicate consistently by sign in the subsamples, we will pay attention only to the 9 consistent effects).

Furthermore, all absence coefficients in the integrated school are positive implying that more absences lead to lower expectations or marks. Patterns of signs are mixed (19 of 35 positive) in the other two schools--another suggestion that absence effects are not important in those schools. Both the number of absences and the associated standard deviation are larger in the integrated school than in the other two schools (See tables 5.2, 5.3, and 5.4) but the two lower class schools look more alike that either looks

Table 6.6

Summary of Structural Coefficients for Peer Influence

Endogenous Variables		T2	T4	T6
E_R	White Middle-Class School	.123	-.135	.091
	Integrated Lower-Class School	.352	.434	-.392
	Black Lower-Class School	.748	N.A.	-.316
E_A	White Middle-Class School	-.137	-.001	.294
	Integrated Lower-Class School	.430	-.588+	-.128
	Black Lower-Class School	.351	.445	-.123
E_C	White Middle-Class School	-.027	-.001	-.158
	Integrated Lower-Class School	-.006	-.093	-.364
	Black Lower-Class School	.140	.157	-.119
M_R	White Middle-Class School	.337+	.093	.293+
	Integrated Lower-Class School	.146	.346	.232
	Black Lower-Class School	.444	1.645*	.502
M_A	White Middle-Class School	.152	.184	.285
	Integrated Lower-Class School	1.000*	.710*	.148
	Black Lower-Class School	.968+	-.444	.513
M_C	White Middle-Class School	-.021	-.412*	.299
	Integrated Lower-Class School	.302+	.534*	.137
	Black Lower-Class School	.654+	-.157	.060

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

like the middle-class school.(See Table 6.7)

Absences appear to be especially influential in first grade in the integrated school. Also marks, more than expectations, are responsive. Exactly what the explanation can be is not clear. Above a certain minimum, absences are discretionary, and perhaps the excess of absences in this school is the consequence of those with a lower commitment to school staying away more often. However, there is no way we can tell whether our conjecture is correct.

Endogeneous Variables: Persistence

A critical feature of the models is their use of repeated measures on the same variable. This strategy has a number of advantages. It offers evidence of reliability. If a variable measured at one time exerts influence on that same variable at a subsequent time we have some evidence that we are measuring the same thing on the two occasions. And of course reliability is a necessary condition for validity. It would be worrisome, for example, if marks in the first semester did not at all predict marks in the second. Persistence also offers a validity check in that, as children mature, we would anticipate that expectations or marks would become more determinate.

In commenting earlier upon heuristic models proposed by Finn (1972) and Braun (1976), we pointed out that their models did not explicitly incorporate measures of persistence, although such an idea is exceedingly important substantively. If marks persist, for example, one conclusion is that teachers push children into a mold that will set boundaries in their achievement.Similarly,if children form expectations early that are

Table 6.7

Summary of Structural Coefficients for Absence

Endogenous Variables		T2	T4	T6
E_R	White Middle-Class School	-.016+	-.001	.004
	Integrated Lower-Class School	.006+	.008*	.005
	Black Lower-Class School	-.003	b	.005
E_A	White Middle-Class School	-.011	-.002	-.002
	Integrated Lower-Class School	.007+,a	.000	.002
	Black Lower-Class School	-.001	.001	.008
E_C	White Middle-Class School	-.014	.011+	.000
	Integrated Lower-Class School	.005+	.001	.002
	Black Lower-Class School	.002	-.001	-.002
M_R	White Middle-Class School	.009	.005	.003
	Integrated Lower-Class School	.008*	.002	.012*
	Black Lower-Class School	.001	-.002	.005
M_A	White Middle-Class School	.002	-.001	.005
	Integrated Lower-Class School	.007*	.005+,a	.007+
	Black Lower-Class School	.001	.006	-.001
M_C	White Middle-Class School	.008	.018	.014*
	Integrated Lower-Class School	-.003	-.005+	.005
	Black Lower-Class School	-.007	.000	.000

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

[a] Inconsistent sign between replications

[b] Variable deleted from model

thereafter maintained, this could be interpreted as evidence of "crystallization".

Repeated measures have methodological significance as well. Many studies of secondary students are flawed because a variable like educational expectations when measured only once may be mis-specified--by ignoring the fact that expectations in 11th grade, say, depend strongly on such expectations at 9th grade, the coefficients linking other variables to 11th grade educational expectations are biased (see Cook and Alexander, 1978). Another methodological consideration is that, in studying change as children progress in school, the best strategy is to incorporate the variable that will change at least twice--repeat the measure in other words. The benefits of such a strategy for studying change are well-known (see Cronbach and Furby, 1970).

Problems arise frequently in interpretation of change, however, even when it has been correctly assessed. If we observe change it can be attributed to the measuring instrument just as readily as to the individual. That is, when marks change it is equally valid to conclude that teachers are changing (using different standards to evaluate performance) as that children are changing (performing differently now compared to earlier). Marks at one time could affect marks at the next time because whatever causes teachers to assign a mark at one time is there to be observed also at the next time. Or, marks at the first time could cause children to perform at the level represented by that mark--having received an A the child tries to live up to it. In any single year these two explanations are completely confounded. However, between years teachers are different and not children, so stability between years is properly attributed to children rather than teachers.

Similarly change in expectations could signify that the task was being interpreted differently by children in second grade as compared to first--they understand what they are doing better as they get older. Or it could be that children's expectations at the later time were actually responding to expectations at the earlier time--crystallization or its lack. With expectations we would argue that change over time attributable to the procedure itself is probably small, and therefore that "change" is in children rather than procedure. We took great pains to make sure children understood what they were being asked.

Marks on Marks

The longitudinal summaries by school revealed strong persistence in marks, especially in the two lower-class schools. In fact, children's marks in the two lower-class schools became very highly determined--coefficients were commonly in the .70's and .80's. In looking at the summary in Table 6.8 of mark persistence over time, one can see that the average structural coefficients for reading and arithmetic are high in every instance for the two lower-class schools except T5 for the black lower-class school. At the end of third grade the average is .91 for the black school and it is above .50 in the integrated school except for T5 where the model did not fit well. The middle-class school displays a consistent but different pattern. The within-year coefficients are fairly substantial--.42, .53, .32--although generally smaller than the typical coefficient in the two lower-class schools. But the yearly fluctuations are noticeable. In fact, there is a cyclic pattern in the middle-class school not seen in the lower-class schools--changes in teachers led to a re-shuffling of marks in the middle-class school.

Table 6.8

Summary of Structural Coefficients Linking Marks at One Time with Marks at a Previous Time

Endogenous Variables	T2	T3	T4	T5	T6
White Middle-Class School					
Reading	.39*	.07	.50*	.14	.33*
Arithmetic	.46*	.04	.56*	.16+	.30*
Conduct	.60*	.26*	.67*	.04	.54*
Reading and Arithmetic Average	.42	.06	.53	.15	.32
Integrated Lower-Class School					
Reading	.78*	.72*	.70*	.42*	N.A.
Arithmetic	.45*	.33*	.60*	.33*	.67*
Conduct	.66*	.49*	.79*	.32*	.72*
Reading and Arithmetic Average	.62	.52	.65	.38	.67
Black Lower-Class School					
Reading	.20	N.A.	.49*	-.08	1.14*
Arithmetic	.66*	N.A.	.88*	.31+	.68*
Conduct	.78*	N.A.	.73*	.00	.80*
Reading and Arithmetic Average	.43	-	.68	.12	.91

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

From first to second grade and from second to third grade the coefficients dropped to .06 and .15, respectively. There seems to be a strong tendency to wipe the slate clean by each new teacher and to re-evaluate the child anew. This tendency plus the much smaller effects attributable to IQ in the early grades go a long way toward explaining why there remains so much variance in the system for middle-class third graders and so little variance in the system for third graders in the other two schools.

Expectations on Expectations

In a large number of instances parameters linking expectations at one time with the similar expectation at the next time are relatively large. Although models for the black school are not as reliably determined as those for the other schools, we see from Table 6.9 that in all three schools there is a tendency for expectations to persist even as early as first grade. For second and third grades there is a significant link between expectations from one time to the next in 10 of 12 possible instances in the middle-class school and in 9 of 12 instances for the integrated school. Findings for the black school are not as clear because there are fewer data to examine, but parameters there for third grade look similar to those in the other two schools.

By third grade differences in persistence of expectations among schools appear negligible. Earlier, however, average persistence of expectations in the lower-class integrated school looks more pronounced than in the middle-class school (.32, .47, .29 vs. .13, .32, .15). A tentative conclusion, since we would expect reliability to be greater in the middle-class school, is that lower-class children's expectations respond

Table 6.9

Summary of Structural Coefficients Linking Children's Expectations at one Time with their Expectations at a Previous Time

	T2	T3	T4	T5	T6
White Middle-Class School					
Reading	.14+	.23*	.17*	.10	.34*
Arithmetic	.10	.38*	.11	.34*	.30*
Conduct	.14*	.32*	.16*	.30*	.27*
Reading and Arithmetic Average	.13	.31	.15	.25	.30
Integrated Lower-Class School					
Reading	.20+	.46*	.33*	.37*	.13
Arithmetic	.28+	.64*	.28*	.27+	.23
Conduct	.48*	.30	.27*	.39*	.51*
Reading and Arithmetic Average	.32	.47	.29	.34	.29
Black Lower-Class School					
Reading	.26	N.A.	N.A.	.51*	.18
Arithmetic	.19	N.A.	.03	.31	.31*
Conduct	.11	N.A.	.40*	.28	.39*
Reading and Arithmetic Average	.19	-	.21	.37	.29

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

less than middle-class children's to new information offered the students in the first two grades. In fact, within any year the cyclic pattern noted for mark persistence in the middle-class school has a counterpart in expectations--within years coefficients are lower.

There is some continuity, then, in children's expectations over time, particularly after the first grade. One implication of this stability is that children's expectations can be reliably assessed even in the two lower-class schools where it is more difficult to communicate with the children.

Endogenous Variables: Feedback

In some respects the relationships among expectations and marks lie at the heart of our models. The impact of expectations on marks and the subsequent feedback from marks to expectations we see as key elements in a dynamic process shaping achievement. Obviously by sampling marks and expectations twice a year we used only a few discrete points in time to sample variables that are continuously interacting. Yet both the first order partial derivatives and some estimation of backward paths (from M_1 to E_1, for example) suggest that the initial cycle is properly specified, with children's expectations acting as a causal force on marks rather than the other way around. After the first cycle, of course in every cycle there is opportunity for marks to impact on expectations at any subsequent time as well as for expectations to influence marks.

In sections to follow, the impact of current and lagged expectations on marks, as well as the impact of marks on expectations will be discussed. Two themes stand out: first, in the middle-class school children's expectations come increasingly into line with marks but this is not the case in the lower-class schools; second, a lack of paths from marks at one time to expectations at the next time is characteristic of the lower-class structural models. The implication is that feedback is processed in one place but not in the other. We will now give the separate summaries.

Effects of Expectations on Marks

Table 6.10 presents a summary of coefficients linking expectations to marks when current expectations are matched to current marks (E_{R1} with M_{R1}, for example) and also when expectations one cycle back are linked to current marks (E_{R1} with M_{R2}, for example).

There appear to be some characteristic differences by school in how expectations affect marks. Since the models for the black lower-class school were impossible to estimate in one instance and the fit was problematic in two other instances, we will discuss mainly the findings for the middle-class white and lower-class integrated schools.

Coefficients for effects of current expectations on current marks show some consistency in the middle-class school--in 8 of 18 instances they attain a respectable size, and in all cases but one the sign is in the expected direction. Consistency of similar effects for the lower-class school is less pronounced--respectable size is achieved in only 4 of 18 possible instances and in 4 instances signs for reading are in the wrong direction and in no instance is the link for reading significant in size.

The picture for lagged expectations is virtually turned around between schools. For the middle-class school, no lagged coefficient reaches any

Table 6.10

Summary of Structural Coefficients' for Effects of Current and Lagged Children's Expectations on Marks

	T1	T2	T3	T4	T5	T6
Impact of Current Expectations						
White Middle-Class School						
Reading	.00	.12+	-.06	.12*	.12	.02
Arithmetic	.06	.01	.10	.16*	.06	.22*
Conduct	.10+	.05	.15+	.11+	.16	.19*
Integrated Lower-Class School						
Reading	-.08	.13	-.05	-.01	.02	-.02
Arithmetic	.10	.13	.15	.06	.17+	.26*
Conduct	.00	.43*	.44*	.16	.09	.04
Black Lower-Class School						
Reading	.19	.35	N.A.	N.A.	.30*	.11
Arithmetic	.18	.08	N.A.	.12	.10	.25*
Conduct	.10	.10	N.A.	.26	.15	-.01
Impact of Lagged Expectations						
White Middle-Class School						
Reading		-.01	-.09	.05	.07	.01
Arithmetic		.07	-.07	-.01	-.03	-.11
Conduct		.07	.09	.03	.08	.04
Integrated Lower-Class School						
Reading		.26*	.02	-.04	.30*	.06
Arithmetic		.20+	-.16	.15+	-.16	-.05
Conduct		-.12	-.28	-.03	.07	.03
Black Lower-Class School						
Reading		-.22	N.A.	-.27*	-.12	-.09
Arithmetic		-.03	N.A.	.34*	-.06	-.01
Conduct		.06	N.A.	-.06	-.04	.10

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

notable size and signs are mixed. For the lower-class integrated school four lagged coefficients are large compared to sampling fluctuation and all of the large ones are in the proper direction and pertain to reading or arithmetic.

We would not care to over-interpret this pattern but in first grade in the lower-class integrated school the lagged effects of expectations on marks in reading and arithmetic are large, in fact larger than any other coefficients for either school, lagged or unlagged. There may be more efficacy in children's initial expectations in the lower-class school than might be judged from analysis of the first cycle alone. When teachers give better marks as the year goes along--as they do in this school--the rewards are bestowed upon children whose initial expectations for themselves were higher.

Effects of Marks on Expectations

In studying the impact of marks on subsequent expectations, we again pay little attention to the black lower-class school for the same reasons as before.

A striking difference appears between the other two schools in how marks at one time affect expectations at a subsequent time (see Table 6.11). In fact, this pattern was so clear it stood out even in the longitudinal summaries. In the middle-class school it is the rule that previous marks shape later expectations, especially within any one year. In other words, mark feedback is processed. In the integrated lower-class school, on the other hand, there are only two borderline-size coefficients connecting marks with subsequent expectations.

Further light can be shed on this comparison by referring back to Figures 5.3, 5.4 and 5.5 which show how children's average expectations

Table 6.11

Summary of Structural Coefficients for Effect of Marks on Subsequent Expectations

	T2	T3	T4	T5	T6
White Middle-Class School					
Reading	.15+	.09	.41*	.07	.33*
Arithmetic	.24+	.10	.28*	.24+	.42*
Conduct	.23*	.16	.24*	.26*	.21*
Integrated Lower-Class School					
Reading	-.16	.15	.03	-.19	N.A.
Arithmetic	-.02	.04	.21+	.12	.18
Conduct	.06	.19+	.09	.12	.06
Black Lower-Class School					
Reading	-.16	-	N.A.	.13	.07
Arithmetic	.17	-	-.11	.04	.28
Conduct	-.04	-	.24+	-.08	.01

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

and marks changed over time. In both schools expectations look about the same in terms of level and there is a mild downward trend in expectation in both schools with the trend more accentuated for the integrated school because children there started out with higher expectations. On the other hand, while marks in the middle-class school fluctuate roughly within the same narrow boundaries (1.6 to 2.0), in the integrated school only conduct marks are in that range. Other marks, after being very low in the first marking period in first grade, range between 3.25 and 2.5 thereafter and are much lower than expectations.

The same conclusions emerge from tabulations of how well the child expected to do in comparison with his actual performance (Tables 6.12, 6.13 and 6.14). In the middle-class school children get better and better at anticipating their marks in all three areas, with errors about equal in both directions. In other words, most children there forecast their mark correctly and the proportion of those who expect to do better is about equal to the proportion of those who expect to do worse.

This kind of symmetry is not seen in the data for the integrated school. There a very large proportion of children do worse than they expect to do (shown also by the large differences in Figure 5.4 and Figure 5.5 between average marks and average expectations), particularly in the case of reading. Furthermore although the number of maximal discrepancies (3 worse) decreases over time, at the end of third grade many children (43% in reading and 25% in arithmetic) are still off by two units or more in their forecasts. That is, 43% of children in this school expect an A or get a C or D, or expect a B and get a D. This information on averages together with the information derived from parameter estimates showing whether expectation affect subsequent marks,

Table 6.12

The Proportion of Children Displaying Various Discrepances
between Their Marks and Expectations over Time:
White Middle-Class School

		T1	T2	T3	T4	T5	T6
Reading							
The child did____ than he expected to do.	3 Better	.01	.01	.00	.00	.00	.00
	2 Better	.02	.01	.01	.01	.00	.01
	1 Better	.17	.17	.15	.25	.19	.21
	The Same	.36	.52	.49	.58	.59	.62
	1 Worse	.39	.27	.32	.17	.22	.16
	2 Worse	.05	.03	.03	.00	.00	.00
	3 Worse	.00	.00	.01	.00	.00	.00
N on which proportion is based		373	364	317	310	247	238
Arithmetic							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.03	.04	.01	.00	.01	.02
	1 Better	.22	.24	.11	.17	.19	.26
	The Same	.43	.45	.50	.54	.55	.56
	1 Worse	.31	.25	.34	.27	.24	.16
	2 Worse	.02	.02	.04	.02	.02	.00
	3 Worse	.00	.00	.00	.00	.00	.00
N on which proportion is based		373	364	323	317	255	245
Conduct							
The child did____ than he expected to do.	3 Better	.01	.00	.00	.00	.00	.00
	2 Better	.06	.02	.02	.01	.00	.00
	1 Better	.19	.22	.30	.27	.13	.22
	The Same	.38	.48	.48	.54	.55	.56
	1 Worse	.32	.24	.17	.17	.29	.21
	2 Worse	.05	.04	.03	.01	.03	.01
	3 Worse	.00	.01	.00	.00	.00	.00
N on which proportion is based		373	362	323	317	255	245

Table 6.13

The Proportion of Children Displaying Various Discrepancies between Their Marks and Expectations over Time
Integrated Lower-Class School

		T1	T2	T3	T4	T5	T6
Reading							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.00	.02	.01	.02	.00	.00
	1 Better	.02	.06	.02	.04	.04	.05
	The Same	.10	.18	.15	.21	.20	.20
	1 Worse	.18	.31	.28	.29	.31	.32
	2 Worse	.40	.29	.31	.29	.30	.28
	3 Worse	.29	.15	.24	.15	.15	.15
N on which proportion is based		288	337	218	232	141	148
Arithmetic							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.00	.02	.00	.00	.01	.01
	1 Better	.04	.07	.02	.08	.05	.08
	The Same	.14	.24	.14	.26	.23	.32
	1 Worse	.42	.33	.34	.37	.33	.34
	2 Worse	.31	.27	.38	.23	.30	.18
	3 Worse	.09	.07	.12	.07	.08	.07
N on which proportion is based		339	342	251	238	184	149
Conduct							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.00	.01	.00	.00	.01	.00
	1 Better	.05	.11	.08	.14	.05	.18
	The Same	.35	.46	.37	.44	.50	.45
	1 Worse	.47	.37	.42	.27	.40	.31
	2 Worse	.13	.06	.14	.16	.04	.06
	3 Worse	.00	.00	.00	.00	.00	.00
N on which proportion is based		336	342	252	237	184	150

Table 6.14

The Proportion of Children Displaying Various Discrepances between Their Marks and Expectations over Time: Black Lower-Class School

		T1	T2	T3	T4	T5	T6
Reading							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.01	.00	.00	.02	.00	.00
	1 Better	.05	.03	.03	.03	.09	.03
	The Same	.13	.16	.13	.20	.24	.15
	1 Worse	.31	.31	.42	.28	.44	.49
	2 Worse	.34	.33	.21	.34	.24	.24
	3 Worse	.17	.17	.20	.12	.00	.09
N on which proportion is based		202	165	99	90	34	59
Arithmetic							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.00	.01	.01	.00	.00	.00
	1 Better	.06	.07	.03	.07	.04	.02
	The Same	.18	.30	.15	.17	.15	.31
	1 Worse	.32	.30	.38	.38	.43	.31
	2 Worse	.36	.24	.36	.31	.27	.27
	3 Worse	.08	.08	.07	.07	.12	.10
N on which proportion is based		215	165	162	116	75	62
Conduct							
The child did____ than he expected to do.	3 Better	.00	.00	.00	.00	.00	.00
	2 Better	.00	.01	.00	.00	.01	.03
	1 Better	.04	.10	.07	.10	.09	.11
	The Same	.31	.28	.40	.54	.46	.40
	1 Worse	.46	.42	.49	.33	.30	.37
	2 Worse	.19	.20	.04	.03	.13	.08
	3 Worse	.00	.00	.00	.00	.00	.00
N on which proportion is based		227	172	163	115	76	62

suggests that marks are being processed in the middle-class school and are not being processed in the integrated school.

Effects of Parents' Expectations on Children

Parents' expectations could affect children's expectations or their marks. The evidence summarized in Table 6.15 suggests that parents' expectations perhaps have more impact on children's expectations in arithmetic than in the other subjects--in 4 of 6 cases in the middle-class school, coefficients are significant. Furthermore although significant coefficients linking parents' expectations to children's expectations appear less often in the other two schools, they do appear mainly in arithmetic. The only other pattern in Table 6.15 that strikes the eye is the sizeable influence of parents' expectations in the middle-class children's expectations for reading in first grade. To the extent children's expectations are determined parents appear important.

Parents are considerably more efficacious when it comes to children's marks, and the consistency in sign and the number of sizeable coefficients for all subjects and for all schools in first grade is impressive. After first grade the picture for the lower-class black school is unclear but it appears that parents exert little impact. In the other two schools parents continue to be influential--Over second and third grades signs of coefficients are almost completely consistent and in 10 of 24 instances large enough to exceed 1.5 times their standard errors.

Overall, children's expectations appear mildly susceptible to parent's expectations. What looks much more important is the direct influence of parents on achievement. Parents could affect achievement by offering learning opportunities at home, supervising homework and the like. In

Table 6.15

Summary of Structural Coefficients for Effects of Parents' Expectations on Children's Expectations and Marks

	T1	T2	T3	T4	T5	T6
Children's Expectations						
White Middle-Class School						
Reading	.30+	.23+	.06	-.12	.23+	.13
Arithmetic	.17	.43*	.24+	.25+	.22+	.12
Conduct	.04	.04	.15	-.01	.15	.13+
Integrated Lower-Class School						
Reading	-.06	.10	-.02	-.08	-.08	.20+
Arithmetic	.12	-.25+	.15	.16+	-.06	.12
Conduct	-.02	.04	.13	.00	.13	.02
Black Lower-Class School						
Reading	.17	.16	N.A.	N.A.	.15	.17
Arithmetic	-.01	.01	N.A.	.41+	.12	.24
Conduct	-.03	.15	N.A.	.07	.13	.09
Marks						
White Middle-Class School						
Reading	.09	.05	.47*	.09	.14	.30*
Arithmetic	.28*	.25*	.16+	.07	.31*	-.03
Conduct	.50*	.29*	.27*	.06	.11	.16*
Integrated Lower-Class School						
Reading	.27*	.20+	.11	.07	.43*	.32*
Arithmetic	.15+	-.05	.08	.12+	.20+	.07
Conduct	.29*	.08	.15	.06	.05	.06
Black Lower-Class School						
Reading	.10	.12	N.A.	-.01	.02	.16
Arithmetic	.33*	.01	N.A.	.03	.10	.00
Conduct	.26+	.08	N.A.	-.08	.02	.11

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

affecting conduct marks, as they seem to do appreciably in the middle-class school, they may also provide learning opportunities by explaining standards or insisting upon acceptable behavior at home. The coefficients for middle-class parents' impact on conduct marks suggests, in fact, that these parents may altogether have substantial influence on achievement: their expectations continue to predict conduct marks even after previous conduct marks (the teacher's expectations) are introduced. Thus change in conduct marks is to some degree owing the parents' standards. In the longitudinal analyses in many instances the conduct mark accounted for part of the mark in reading and arithmetic; therefore by affecting conduct marks the middle-class parent may wield considerable influence on academic achievement over the early grades.

Effects of Conduct Marks on other Marks

As we have seen in the longitudinal summary, frequently marks in reading and arithmetic were responsive to conduct marks. In Table 6.16, we see that, with one exception, the effects are in the expected direction and many are substantial in size. The second cycle is particularly interesting because by then marks in reading and arithmetic are "controlled" in terms of previous marks in those subjects but conduct is influential.

Two main mechanisms could explain the influence of conduct marks in reading and arithmetic. The first involves teachers' judgments--children who are well-behaved are apt to be judged more leniently, a "halo" effect. Secondly, children who are better behaved may actually learn better because children who are quiet and orderly may be able to profit more from instruction.

Table 6.16

Summary of Structural Coefficients Linking Conduct Marks to other Marks

	T1	T2	T3	T4	T5	T6
White Middle-Class School						
Reading	.26*	.18*	.25*	.10+	.13	.08
Arithmetic	.14*	.18*	.22*	.12*	.13	.14*
Integrated Lower-Class School						
Reading	.03	.34*	.17+	.10	.18	.16
Arithmetic	.27+	.29*	.10	.16*	.15	.08
Black Lower-Class School						
Reading	.12	.19	N.A.	.11	.26*	.22*
Arithmetic	.29*	.17	N.A.	.16	.06	-.01

*Coefficient more than twice its standard error.

+Coefficient more than 1.5 times its standard error.

In the present analysis there is no way to separate out halo effects from learning effects. One could inquire to what extent conduct marks predict scores on standardized achievement net of other marks, however, and since halo effects are absent from standardized scores, a correlation between conduct marks and standardized scores could represent the impact of conduct on learning opportunities. Some analyses along these lines will be presented in Chapter 7.

Altogether Table 6.16 suggests that conduct is an appreciable component of academic performance in every school.

Summary of Variable Effects

Absence effects seem more noticeable in the integrated lower-class school but the picture is far from clear. Sex, on the other hand, has many effects especially in the early cycles. The mode of operation of IQ looks different by place; in the middle-class school it affects mainly conduct. Children's expectations link to marks somewhat better in the middle-class school, but marks affect subsequent expectations only in that school. Parents' have numerous direct effects upon marks, noticeable earlier in the middle-class school. Children's expectations do not affect parents' expectations, but parents' expectations affect children's expectations especially in the middle-class school. Marks in conduct generally affect marks in the academic areas, especially in the early grades.

A bird's eye view of the schooling process as revealed by these models suggests that children's expectations, insofar as we have been able to measure them, are about as well determined in one place as another but that in the two lower-class schools they are less likely to affect marks. Parents there also are less likely to affect marks. Sex and IQ consistently have some effects on marks in the lower class schools. Most important, perhaps, marks tend to persist in the lower-class schools but only persist within one year in the middle-class school. Between years in the middle-class school marks do not persist. However, children in that school use feedback from marks to calibrate their expectations. In the other two schools average expectation levels decline but the decline is not a clear consequence of mark feedback. All in all the total system in the middle-class school appears looser and the child appears to be better articulated within it. Effects of socioeconomic status appear much more prominent than effects attributable to race. In fact race effects per se are few and inconsistent.

Relative Sizes of Effects

So far we have emphasized comparisons among models over time (within one school) or across schools (at one time). The same variables sampled in different populations naturally have different variances, so in these comparisons metric parameters have served as the basis for discussion. In addition to structural coefficients provided in Tables 6A.19 to 6A.36, standardized coefficients for all cases are also provided and the standardized coefficients give notions of relative sizes of effects within any one model.

Fortunately, as we mentioned earlier, parents' expectations, children's expectations and marks have a similar metric (1, 2, 3, 4) and sex, race, and peer ratings are also coded in a narrow range, so most metric coefficients turn out to be much like the standardized coefficients. The main exceptions are IQ (coded in whatever metric the test provided but generally coded as 2 or 3 digits ranging from about 70 to 125) and absences (ranging from 0 to about 30 per year). As would be anticipated, standardized coefficients for IQ suggest that it is relatively important--the standardized coefficients usually are in the .20 to .40 range and occasionally higher--standardized coefficients for absences range from .10 to .20, suggesting less importance relatively. We do not intend to go through Figures 6.1M to 6.6B systematically but, where effects are stable enough to appear in those diagrams, standardized sex effects are a little smaller than those shown, standardized IQ effects are much larger than those shown (10 to 20 times), PEER effects are about half or less times the size of those shown, and ABS effects are 10 or more times the magnitudes shown. In other words, when scaled in the same metric, IQ and ABS look as potent as other variables and peer and sex effects look somewhat less efficacious.

IQ would certainly be expected to play a role in any set of models like ours, but the nature of the role in various places is at the heart of our concerns. The fact that IQ may be "as important as sex" in determining marks in conduct in one middle-class school, however, cannot be a very reliable conclusion given the limits of our sample. On the other hand, that IQ affects mainly conduct marks in the middle-class school in first and second grades but marks in reading and arithmetic in the two lower class schools is a conclusion warranting more attention for it is based, not only on subsample replication, but successive samples over time in the same place. So much for the standardized coefficients.

Table 6A.1

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 1, Middle-Class School (Corresponding to Model in Figures 5.6 and 6.1M)

	$ABIL_1$	PE_{R1}	PE_{A1}	PE_{C1}	E_{R1}	E_{A1}	E_{C1}	M_{R1}	M_{A1}	M_{C1}	SEX	IQ
$ABIL_1$	193 (.6631)	187	187	188	190	190	190	173	173	173	193	50
PE_{R1}	.63327 (.3245)	348 (.3960)	348	342	338	338	338	323	323	323	348	203
PE_{A1}	.58154 (.2992)	.53998 (.2147)	348 (.3992)	342	338	338	338	323	323	323	348	203
PE_{C1}	.34826 (.1739)	.33900 (.1308)	.33814 (.1310)	343 (.3760)	334	334	334	319	319	319	343	197
E_{R1}	-.06095 (-.0384)	.03928 (.0191)	.03006 (.0147)	.14913 (.0708)	408 (.5992)	408	408	373	373	373	408	228
E_{A1}	-.00121 (-.0008)	-.01606 (-.0079)	.12554 (.0622)	.02434 (.0117)	.03335 (.0203)	408 (.6153)	408	373	373	373	408	228
E_{C1}	.10071 (.0709)	-.01278 (-.0070)	.05307 (.0290)	.09720 (.0515)	.13383 (.0896)	-.01585 (-.0107)	408 (.7477)	373	373	373	408	228
M_{R1}	.26266 (.1196)	.27044 (.0952)	.18205 (.0643)	.15570 (.0534)	.03761 (.0163)	.06175 (.0271)	-.02190 (-.0106)	380 (.3126)	380	380	380	226
M_{A1}	.12955 (.0534)	.20022 (.0638)	.30171 (.0965)	.13179 (.0409)	.05342 (.0209)	.16261 (.0646)	.09816 (.0430)	.33993 (.0962)	380 (.2563)	380	380	226
M_{C1}	-.01271 (-.0068)	.12928 (.0533)	.16240 (.0672)	.36398 (.1463)	.11790 (.0598)	-.02342 (-.0120)	.15295 (.0867)	.28946 (.1061)	.21788 (.0723)	380 (.4295)	380	226
SEX	-.04831 (-.0197)	-.08924 (-.0281)	.06263 (.0198)	-.17078 (-.0524)	-.01330 (-.0052)	.04785 (.0188)	-.19113 (-.0827)	-.09298 (-.0260)	.03846 (.0097)	-.28467 (-.0934)	(.2504)	237
IQ	.51372 (4.6328)	.43873 (3.0577)	.50663 (3.5449)	.24517 (1.6649)	.05256 (.4506)	.17944 (1.5588)	-.01996 (- .1912)	.19872 (1.2304)	.26650 (1.4934)	.12151 (.8820)	.01950 (.1081)	237 (-122.6490)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.2

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 2, Middle-Class School (Corresponding to Model in Figures 5.7 and 6.2M)

	E_{R2}	E_{A2}	E_{C2}	M_{R2}	M_{A2}	M_{C2}	E_{R1}	E_{A1}	E_{C1}	M_{R1}	M_{A1}	M_{C1}	PE_{R1}	PE_{A1}	PE_{C1}	$ABIL_1$	$PEER_1$	ABS_1
E_{R2}	385 (.3944)	385	385	364	364	361	369	369	369	358	358	358	332	332	327	183	348	281
E_{A2}	-.02230 (.0107)	385 (.5787)	385	364	364	361	369	369	369	358	358	358	332	332	327	183	348	281
E_{C2}	.01226 (.0050)	.06162 (.0302)	386 (.4160)	365	365	362	370	370	370	359	359	359	333	333	328	184	348	282
M_{R2}	.19516 (.0754)	.01727 (.0081)	.12933 (.0513)	387 (.3782)	387	384	372	372	372	373	373	373	317	317	312	173	342	301
M_{A2}	.10893 (.0400)	.16927 (.0753)	.00719 (.0027)	.46839 (.1684)	387 (.3418)	384	372	372	372	373	373	373	317	317	312	173	342	301
M_{C2}	.02047 (.0088)	-.00069 (-.0004)	.20162 (.0894)	.30012 (.1269)	.33478 (.1345)	384 (.4724)	369	369	369	370	370	370	315	315	310	171	339	298
E_{R1}	.15332 (.0745)	.05083 (.0299)	.01683 (.0084)	.03759 (.0179)	.06721 (.0304)	.08262 (.0440)	408 (.5992)	408	408	373	373	373	338	338	334	190	346	291
E_{A1}	.08905 (.0439)	.15506 (.0925)	.08368 (.0423)	.07191 (.0347)	.19319 (.0886)	.04999 (.0269)	.03335 (.0203)	408 (.6153)	408	373	373	373	338	338	334	190	346	291
E_{C1}	.07710 (.0419)	-.04277 (-.0281)	.17105 (.0954)	.09635 (.0512)	.06097 (.0308)	.19482 (.1158)	.13383 (.0896)	-.01585 (-.0107)	408 (.7477)	373	373	373	338	338	334	190	346	291
M_{R1}	.15720 (.0552)	.09965 (.0424)	.06299 (.0227)	.48605 (.1671)	.33772 (.1104)	.21942 (.0843)	.03761 (.0163)	.06175 (.0271)	-.02190 (-.0106)	380 (.3126)	380	380	323	323	319	173	335	295
M_{A1}	.03025 (.0096)	.23799 (.0917)	.06452 (.0211)	.26956 (.0839)	.52234 (.1546)	.23214 (.0808)	.05342 (.0209)	.16261 (.0646)	.09816 (.0430)	.33993 (.0962)	380 (.2563)	380	323	323	319	173	335	295
M_{C1}	.09457 (.0389)	.01625 (.0081)	.24264 (.1026)	.22694 (.0915)	.28217 (.1081)	.63740 (.2871)	.11790 (.0598)	-.02342 (-.0120)	.15295 (.0867)	.28946 (.1061)	.21788 (.0723)	380 (.4295)	323	323	319	173	335	295
PE_{R1}	.16844 (.0666)	.15711 (.0752)	-.03141 (-.0127)	.30475 (.1179)	.27973 (.1029)	.20120 (.0870)	.03928 (.0191)	-.01606 (-.0079)	-.01278 (-.0070)	.27044 (.0952)	.20022 (.0638)	.12928 (.0533)	348 (.3960)	348	342	187	303	242
PE_{A1}	.07274 (.0289)	.22165 (.1065)	-.05797 (-.0236)	.26641 (.1035)	.37883 (.1399)	.20075 (.0872)	.03006 (.0147)	.12544 (.0622)	.05307 (.0290)	.18205 (.0643)	.30171 (.0965)	.16240 (.0672)	.53998 (.2147)	348 (.3992)	342	187	303	242
PE_{C1}	.04949 (.0191)	-.02582 (-.0120)	.07400 (.0293)	.24923 (.0940)	.22990 (.0824)	.44641 (.1881)	.14913 (.0708)	.02434 (.0117)	.09720 (.0515)	.15570 (.0534)	.13179 (.0409)	.36398 (.1463)	.33900 (.1308)	.33814 (.1310)	343 (.3760)	188	299	242
$ABIL_1$	.05836 (.0298)	.03934 (.0244)	-.09298 (-.0488)	.25914 (.1298)	.16909 (.0805)	.11844 (.0663)	-.06095 (-.0384)	-.00121 (-.0008)	.10071 (.0709)	.26266 (.1196)	.12955 (.0534)	-.01271 (-.0068)	.63327 (.3245)	.58154 (.2992)	.34826 (.1739)	193 (.6631)	172	173
$PEER_1$	.09324 (.0177)	.03838 (.0088)	-.02220 (-.0043)	.22579 (.0419)	.19356 (.0342)	.07124 (.0148)	-.01667 (-.0039)	.00772 (.0018)	-.00719 (-.0019)	.17017 (.0287)	.20831 (.0318)	.04361 (.0086)	.21569 (.0410)	.21221 (.0405)	.19687 (.0364)	.16837 (.0414)	364 (.0911)	274
ABS_1	-.15065 (-.5621)	-.06088 (-.2752)	-.09401 (-.3603)	.03710 (.1356)	.02846 (.0989)	.05856 (.2392)	.02715 (.1249)	.01105 (.0515)	-.00705 (-.0362)	-.02285 (-.0759)	-.01445 (-.0435)	.02120 (.0826)	-.14291 (-.5343)	-.03446 (-.1294)	-.00934 (-.0340)	-.13642 (-.6600)	-.01162 (-.0208)	302 (35.3026)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.3

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 3, Middle-Class School (Corresponding to Model in Figures 5.8 and 6.3M)

	$ABIL_3$	PE_{R3}	PE_{A3}	PE_{C3}	E_{R3}	E_{A3}	E_{C3}	M_{R3}	M_{A3}	M_{C3}	E_{R2}	E_{A2}	E_{C2}	M_{R2}	M_{A2}	M_{C2}	SEX	IQ	$ABIL_1$	PE_{R1}	PE_{A1}	PE_{C1}
$ABIL_3$	198 (.7137)	194	194	194	195	195	195	181	186	186	176	176	177	178	178	176	198	112	100	153	153	153
PE_{R3}	.57217 (.2965)	271 (.3761)	270	271	265	265	265	249	255	255	233	233	234	235	235	233	269	172	96	208	208	204
PE_{A3}	.51753 (.2691)	.52421 (.1979)	270 (.3790)	270	264	264	264	248	254	254	233	233	234	235	235	233	268	172	96	208	208	204
PE_{C3}	.38254 (.2018)	.23641 (.0905)	.30553 (.1174)	271 (.3899)	265	265	265	249	255	255	233	233	234	235	235	233	269	172	96	208	208	204
E_{R3}	[illegible] (.0343)	.12546 (.0452)	.06010 (.0217)	.12554 (.0460)	344 (.3445)	344	344	317	323	323	283	283	284	287	287	284	339	202	115	245	245	240
E_{A3}	.20908 (.1287)	.27309 (.1220)	.32791 (.1471)	.11560 (.0526)	.02949 (.0126)	344 (.5309)	344	317	323	323	283	283	284	287	287	284	339	202	115	245	245	240
E_{C3}	-.02375 (-.0144)	.02366 (.0104)	-.01302 (-.0058)	.24071 (.1081)	.13060 (.0551)	-.01048 (-.0055)	344 (.5172)	317	323	323	283	283	284	287	287	284	339	202	115	245	245	240
M_{R3}	.25153 (.1212)	.51440 (.1799)	.31104 (.1092)	.12949 (.0461)	.05217 (.0175)	.18080 (.0751)	.07959 (.0326)	332 (.3252)	332	331	277	277	278	282	282	279	330	200	110	242	242	237
M_{A3}	.35369 (.1480)	.36360 (.1104)	.39716 (.1211)	.10773 (.0333)	.12299 (.0357)	.27451 (.0990)	.02853 (.0102)	.50600 (.1429)	338 (.2452)	337	280	280	281	285	285	282	336	202	110	244	244	239
M_{C3}	-.03802 (-.0214)	.17402 (.0710)	.12730 (.0524)	.30537 (.1269)	.12684 (.0496)	.13617 (.0660)	.27091 (.1297)	.38161 (.1449)	.31451 (.1037)	337 (.4432)	280	280	281	285	285	282	335	202	110	244	244	239
E_{R2}	.08510 (.0451)	.18138 (.0699)	.07551 (.0292)	-.06044 (-.0237)	.19523 (.0720)	.10004 (.0458)	.01772 (.0080)	.04480 (.0160)	.08517 (.0265)	.03474 (.0145)	385 (.3944)	385	385	364	364	361	385	227	183	332	332	327
E_{A2}	.03336 (.0214)	.10295 (.0480)	.20864 (.0977)	-.03903 (-.0185)	.01835 (.0082)	.38595 (.2139)	-.06736 (-.0369)	.01470 (.0064)	.03770 (.0142)	.06602 (.0334)	-.02230 (-.0107)	385 (.5787)	385	364	364	361	385	227	183	332	332	327
E_{C2}	-.11227 (-.0612)	-.00580 (-.0023)	-.01547 (-.0061)	.13809 (.0556)	.08004 (.0303)	.03422 (.0161)	.30479 (.1414)	.15902 (.0585)	.01852 (.0059)	.22732 (.0976)	.01226 (.0050)	.06162 (.0302)	386 (.4160)	365	365	362	386	228	184	333	333	328
M_{R2}	.39447 (.2049)	.50637 (.1910)	.35634 (.1334)	.28339 (.1088)	.14066 (.0508)	.10284 (.0461)	.01437 (.0064)	.40077 (.1406)	.33017 (.1006)	.27016 (.1106)	.19516 (.0751)	.01727 (.0081)	.12933 (.0513)	387 (.3782)	387	384	387	227	173	317	317	312
M_{A2}	.23548 (.1163)	.33222 (.1191)	.37779 (.1360)	.15396 (.0562)	.02887 (.0099)	.24310 (.1035)	.01713 (.0072)	.21056 (.0702)	.26620 (.0771)	.18786 (.0731)	.10893 (.0400)	.16927 (.0753)	.00719 (.0027)	.46839 (.1684)	387 (.3418)	384	387	227	173	317	317	312
M_{C2}	.09879 (.0574)	.19526 (.0823)	.12103 (.0512)	.39729 (.1705)	.10300 (.0415)	.04767 (.0239)	.24144 (.1193)	.21925 (.0859)	.14802 (.0504)	.40943 (.1873)	.02047 (.0088)	-.00069 (-.0004)	.20162 (.0894)	.30012 (.1269)	.33478 (.1345)	384 (.4724)	384	227	171	315	315	310
SEX	.08923 (.0377)	-.04247 (-.0130)	.07535 (.0232)	-.10356 (-.0324)	-.11055 (-.0325)	.12585 (.0459)	-.17888 (-.0644)	-.14536 (-.0415	.04162 (.0103)	-.22019 (-.0734)	-.07531 (-.0237)	.14648 (.0558)	-.24288 (-.0784)	-.20758 (-.0639)	-.01524 (-.0045)	-.30004 (-.1032)	(.2504)	237	193	348	348	343
IQ	.56116 (5.2501)	.35316 (2.3987)	.37503 (2.5568)	.12689 (.8774)	-.05966 (-.3878)	.18470 (1.4904)	-.14597 (-1.1626)	.26044 (1.6449)	.36893 (2.0233)	.05784 (.4264)	.17857 (1.2419)	.10532 (.8872)	-.01428 (- .1020)	.29451 (2.0059)	.36818 (2.3837)	.13540 (1.0306)	.01950 (.1081)	237 (-122.6490)	50	203	203	197
$ABIL_1$	.70298 (.4838)	.45113 (.2253)	.43727 (.2167)	.31846 (.1619)	.00112 (.0005)	.19509 (.1157)	.05256 (.0308	.28632 (.1330)	.21177 (.0854)	.05364 (.0291)	.05836 (.0298)	.03934 (.0244)	-.09298 (-.0488)	.25914 (.1298)	.16909 (.0805)	.11844 (.0663)	-.04831 (-.0197)	-.51372 (-4.6328)	193 (.6631)	187	187	188
PE_{R1}	.43708 (.2324)	.36461 (.1407)	.33206 (.1286)	.23237 (.0913)	.07759 (.0287)	.21000 (.0963)	.01874 (.0085)	.20707 (.0743)	.34612 (.1079)	.14659 (.0614)	.16844 (.0666)	.15711 (.0752)	-.03141 (-.0127)	.30475 (.1179)	.27973 (.1029)	.20120 (.0870)	-.08924 (-.0281)	-.43873 (-3.0577)	.63327 (.3245)	348 (.3960)	348	342
PE_{A1}	.38619 (.2061)	.30606 (.1186)	.42700 (.1661)	.18151 (.0716)	-.00623 (-.0023)	.27336 (.1258)	-.00882 (-.0040)	.24440 (.0881)	.36953 (.1156)	.18155 (.0764)	.07274 (.0289)	.22165 (.1065)	-.05797 (-.0236)	.26641 (.1035)	.37883 (.1399)	.20075 (.0872)	.06263 (.0198)	-.50663 (-3.5449)	.58154 (.2992)	.53998 (.2147)	348 (.3992)	342
PE_{C1}	.30746 (.1593)	.16623 (.0625)	.14473 (.0546)	.46975 (.1799)	.10484 (.0377)	.06377 (.0285)	.13581 (.0599)	.14701 (.0514)	.19831 (.0602)	.32150 (.1312)	.04949 (.0191)	-.02582 (-.0120)	.07400 (.0293)	.24923 (.0940)	.22990 (.0824)	.44641 (.1881)	-.17078 (-.0524)	-.24517 (-1.6649)	.34826 (.1739)	.33900 (.1308)	.33814 (.1310)	343 (.3760)

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[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.4

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 4, Middle-Class School (Corresponding to Model in Figures 5.9 and 6.4M)

	E_{R4}	E_{A4}	E_{C4}	M_{R4}	M_{A4}	M_{C4}	E_{R3}	E_{A3}	E_{C3}	M_{R3}	M_{A3}	M_{C3}	PE_{R3}	PE_{A3}	PE_{C3}	$ABIL_3$	$PEER_4$	ABS_4
E_{R4}	330 (.3759)	330	330	311	317	317	312	312	312	309	315	314	252	251	252	184	310	313
E_{A4}	-.04099 (-.0175)	330 (.4851)	330	311	317	317	312	312	312	309	315	314	252	251	252	184	310	313
E_{C4}	.09126 (.0322)	.05885 (.0236)	330 (.3320)	311	317	317	312	312	312	309	315	314	252	251	252	184	310	313
M_{R4}	.35849 (.1224)	.17271 (.0670)	.18201 (.0584)	335 (.3100)	335	335	319	319	319	330	331	330	248	247	248	179	313	331
M_{A4}	.21134 (.0742)	.38902 (.1551)	.08643 (.0285)	.47403 (.1511)	341 (.3275)	341	324	324	324	331	337	336	254	253	254	185	319	335
M_{C4}	.17329 (.0694)	.17543 (.0799)	.30578 (.1151)	.29029 (.1056)	.27888 (.1043)	341 (.4271)	324	324	324	331	337	336	254	253	254	185	319	335
E_{R3}	.15428 (.0555)	.16065 (.0657)	.14893 (.0504)	.11915 (.0389)	.12942 (.0435)	.11147 (.0428)	344 (.3445)	344	344	317	323	323	265	264	265	195	313	319
E_{A3}	.03152 (.0141)	.21540 (.1093)	.08357 (.0351)	.15226 (.0618)	.23406 (.0976)	.08006 (.0381)	.02949 (.0126)	344 (.5309)	344	317	323	323	265	264	265	195	313	319
E_{C3}	.14918 (.0658)	.08780 (.0440)	.25567 (.1060)	.10946 (.0438)	.11133 (.0458)	.24545 (.1154)	.13060 (.0551)	-.01048 (-.0055)	344 (.5172)	317	323	323	265	264	265	195	313	319
M_{R3}	.32215 (.1126)	.12383 (.0492)	.15417 (.0507)	.61984 (.1968)	.43187 (.1410)	.24997 (.0932)	.05217 (.0175)	.18080 (.0751)	.07959 (.0326)	332 (.3252)	332	331	249	248	249	181	311	327
M_{A3}	.14988 (.0455)	.27173 (.0937)	.12254 (.0350)	.38991 (.1075)	.60289 (.1709)	.22070 (.0714)	.12299 (.0357)	.27451 (.0990)	.02853 (.0102)	.50600 (.1429)	338 (.2452)	337	255	254	255	186	317	331
M_{C3}	.18324 (.0748)	.17863 (.0828)	.30249 (.1160)	.33413 (.1238)	.30362 (.1157)	.65147 (.2834)	.12684 (.0496)	.13617 (.0660)	.27091 (.1397)	.38161 (.1449)	.31451 (.1037)	337 (.4432)	255	254	255	186	316	330
PE_{R3}	.20545 (.0773)	.11635 (.0497)	.04047 (.0143)	.43630 (.1490)	.35976 (.1263)	.19573 (.0784)	.12546 (.0452)	.27309 (.1220)	.02366 (.0104)	.51440 (.1799)	.36360 (.1104)	.17402 (.0710)	271 (.3761)	270	271	194	249	250
PE_{A3}	.03782 (.0143)	.28760 (.1233)	-.05449 (-.0193)	.31822 (.1091)	.41713 (.1470)	.10257 (.0413)	.06010 (.0217)	.32791 (.1471)	-.01302 (-.0058)	.31104 (.1092)	.39716 (.1211)	.12790 (.0524)	.52421 (.1979)	270 (.3790)	270	194	248	249
PE_{C3}	.06105 (.0234)	.02044 (.0089)	.08539 (.0307)	.11532 (.0401)	.19280 (.0689)	.31764 (.1296)	.12554 (.0460)	.11560 (.0526)	.24071 (.1081)	.12949 (.0461)	.10773 (.0333)	.30537 (.1269)	.23641 (.0905)	.30553 (.1174)	271 (.3899)	194	249	250
$ABIL_3$	.19814 (.1026)	.15365 (.0904)	-.11393 (-.0555)	.25825 (.1215)	.37994 (.1837)	.10539 (.0582)	.06927 (.0343)	.20908 (.1287)	-.02375 (-.0144)	.25153 (.1212)	.35369 (.1480)	-.03802 (-.0214)	.57217 (.2965)	.51753 (.2691)	.38254 (.2018)	198 (.7137)	184	181
$PEER_4$	.05041 (.0095)	.05394 (.0115)	.02307 (.0041)	.18751 (.0320)	.18260 (.0321)	.01667 (.0033)	-.03772 (-.0068)	.05740 (.0128)	-.00177 (-.0004)	.22474 (.0393)	.12666 (.0192)	.10209 (.0208)	.15516 (.0292)	.18815 (.0355)	.12680 (.0243)	.26331 (.0682)	332 (.0941)	314
ABS_4	-.02144 (-.0812)	.04591 (.1974)	.11530 (.4102)	.10212 (.3511)	.05341 (.1887)	.13484 (.5038)	-.04054 (-.1469)	.11037 (.4965)	.01076 (.0478)	.06722 (.2367)	.03882 (.1187)	.00429 (.0176)	.04229 (.1602)	.17442 (.6603)	-.05238 (-.2019)	-.07816 (-.4077)	.15574 (.2949)	336 (38.1245)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.5

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 5, Middle-Class School (Corresponding to Model in Figures 5.10 and 6.5M)

	$ABIL_5$	PE_{R5}	PE_{A5}	PE_{C5}	E_{R5}	E_{A5}	E_{C5}	M_{R5}	M_{A5}	M_{C5}	E_{R4}	E_{A4}	E_{C4}	M_{R4}	M_{A4}	M_{C4}	SEX	IQ	$ABIL_3$	PE_{R3}	PE_{A3}	PE_{C3}
$ABIL_5$	223 (.8118)	222	223	223	217	217	217	203	211	211	179	179	179	186	190	190	223	136	100	161	160	161
PE_{R5}	.57594 (.2975)	222 (.3287)	222	222	216	216	216	203	211	211	178	178	178	185	189	189	222	136	100	161	160	161
PE_{A5}	.50288 (.2249)	.33407 (.0951)	223 (.2464)	223	217	217	217	203	211	211	179	179	179	186	190	190	223	136	100	161	160	161
PE_{C5}	.33324 (.1762)	.33867 (.1139)	.32142 (.0936)	223 (.3442)	217	217	217	203	211	211	179	179	179	186	190	190	223	136	100	161	160	161
E_{R5}	.23758 (.1124)	.28363 (.0834)	.08378 (.0218)	.12541 (.0386)	270 (.2755)	270	270	247	255	255	212	212	212	221	225	225	270	161	115	179	178	179
E_{A5}	.17785 (.1022)	.07642 (.0279)	.35351 (.1119)	.10822 (.0405)	-.01271 (-.0043)	270 (.4065)	270	247	255	255	212	212	212	221	225	225	270	161	115	179	178	179
E_{C5}	.14708 (.0814)	.08404 (.0296)	-.03710 (-.0113)	.25279 (.0911)	.11448 (.0369)	-.03831 (-.0150)	270 (.3769)	247	255	255	212	212	212	221	225	225	270	161	115	179	178	179
M_{R5}	.42518 (.1998)	.46502 (.1390)	.28389 (.0735)	.19171 (.0587)	.23476 (.0643)	.12593 (.0419)	.08071 (.0258)	259 (.2720)	259	259	205	205	205	214	218	218	259	160	111	173	172	173
M_{A5}	.26930 (.1233)	.19194 (.0559)	.35569 (.0897)	.23069 (.0688)	.03394 (.0091)	.23034 (.0746)	-.03604 (.0112)	.36381 (.0964)	268 (.2582)	268	212	212	212	221	225	225	268	160	111	178	177	178
M_{C5}	.21118 (.1077)	.26905 (.0873)	.14833 (.0417)	.25488 (.0846)	.08346 (.0248)	.08168 (.0295)	.26987 (.0937)	.30209 (.0891)	.22829 (.0656)	268 (.3201)	212	212	212	221	225	225	268	160	111	178	177	178
E_{R4}	.26610 (.1470)	.31867 (.1120)	.16116 (.0490)	.19982 (.0719)	.23928 (.0770)	.01993 (.0078)	.25522 (.0961)	.25854 (.0827)	.02714 (.0085)	.13604 (.0472)	330 (.3759)	330	330	311	317	317	328	123	184	252	251	252
E_{A4}	.08901 (.0559)	0.1131 (.0045)	.31120 (.1076)	-.00465 (-.0019)	.13164 (.0481)	.45783 (.2033)	.07184 (.0307)	.16023 (.0582)	.16724 (.0592)	.07358 (.0290)	-.04099 (-.0175)	330 (.4851)	330	311	317	317	328	123	184	252	251	252
E_{C4}	-.00592 (-.0031)	.08126 (.0268)	-.00132 (-.0004)	.06806 (.0230)	.11888 (.0360)	-.06101 (-.0224)	.35503 (.1256)	.08752 (.0263)	-.00664 (-.0019)	.17538 (.0572)	.09126 (.0322)	.05885 (.0236)	330 (.3320)	311	317	317	328	123	184	252	251	252
M_{R4}	.41055 (.2060)	.56558 (.1805)	.33948 (.0938)	.33971 (.1110)	.21197 (.0620)	.10349 (.0367)	.19765 (.0676)	.43757 (.1271)	.21293 (.0602)	.31872 (.1004)	.35849 (.1224)	.17271 (.0670)	.18201 (.0584)	335 (.3100)	335	335	333	131	179	248	247	248
M_{A4}	.36934 (.1904)	.30780 (.1010)	.39827 (.1131)	.30034 (.1008)	.07412 (.0223)	.39912 (.1456)	.16005 (.0562)	.36796 (.1098)	.34228 (.0995)	.22586 (.0731)	.21134 (.0742)	.38902 (.1551)	.08643 (.0285)	.47403 (.1511)	341 (.3275)	341	339	135	185	254	253	254
M_{C4}	.20262 (.1193)	.12041 (.0451)	.07551 (.0245)	.37370 (.1429)	.02976 (.0102)	.06378 (.0266)	.38314 (.1537)	.11075 (.0377)	.04629 (.0154)	.25923 (.0958)	.17329 (.0694)	.17543 (.0799)	.30578 (.1151)	.29029 (.1056)	.27888 (.1043)	341 (.4271)	339	135	185	254	253	254
SEX	-.04863 (-.0219)	-.14685 (-.0421)	.23023 (.0594)	-.07442 (-.0218)	-.15301 (-.0402)	.17903 (.0571)	-.13352 (-.0410)	-.09533 (-.0249)	.00759 (.0019)	-.19009 (-.0538)	-.05548 (-.0170)	.10519 (.0367)	-.12926 (-.0373)	-.15563 (-.0434)	.03027 (.0087)	-.23219 (-.0759)	(.2504)	176	198	269	268	269
IQ	.26715 (3.3915)	.32099 (2.5929)	.35286 (2.4680)	.20091 (1.6608)	-.07992 (-.5911)	.21251 (1.9091)	-.02850 (-.2465)	.29114 (2.1393)	.15876 (1.1366)	.12274 (.9785)	.04118 (.3558)	.19746 (1.9378)	-.01444 (-.1172)	.32065 (2.5156)	.32544 (2.6242)	.16063 (1.4790)	.14633 (1.0317)	176 (-198.5281)	113	114	114	114
$ABIL_3$	.72901 (.5549)	.46958 (.2274)	.50134 (.2102)	.30296 (.1502)	.13526 (.0600)	.12705 (.0684)	.08568 (.0444)	.32471 (.1431)	.18225 (.0782)	.16590 (.0793)	.19814 (.1026)	.15365 (.0904)	-.11393 (-.0555)	.25825 (.1215)	.37994 (.1837)	.10539 (.0582)	.08923 (.0377)	-.28974 (-3.4489)	198 (.7137)	194	194	194
PE_{R3}	.55651 (.3075)	.63637 (.2237)	.38659 (.1177)	.36601 (.1317)	.31446 (.1012)	.07615 (.0298)	.05270 (.0198)	.41301 (.1321)	.24935 (.0777)	.25069 (.0870)	.20545 (.0773)	.11635 (.0497)	.04047 (.0143)	.43630 (.1490)	.35976 (.1263)	.19573 (.0784)	-.04247 (-.0130)	-.17778 (-1.5362)	.57217 (.2965)	271 (.3761)	270	271
PE_{A3}	.53383 (.2961)	.37653 (.1329)	.47327 (.1446)	.31266 (.1129)	.12355 (.0399)	.26509 (.1040)	.08033 (.0304)	.29726 (.0954)	.30038 (.0940)	.27567 (.0960)	.03782 (.0143)	.28760 (.1233)	-.05449 (-.0193)	.31822 (.1091)	.41713 (.1470)	.10257 (.0413)	.07535 (.0232)	-.35235 (-3.0562)	.51753 (.2691)	.52421 (.1979)	270 (.3790)	270
PE_{C3}	.23425 (.1318)	.21890 (.0783)	.13912 (.0431)	.47898 (.1755)	.03701 (.0121)	-.10009 (-.0398)	.23753 (.0910)	.05001 (.0163)	.01257 (.0040)	.08483 (.0300)	.06105 (.0234)	.02044 (.0089)	.08539 (.0307)	.11532 (.0401)	.19280 (.0689)	.31764 (.1296)	-.10356 (-.0324)	-.16090 (-1.4156)	.38254 (.2018)	.23641 (.0905)	.30553 (.1174)	271 (.3[illegible])

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[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.6

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 6, Middle-Class School (Corresponding to Model in Figures 5.11 and 6.6M)

	E_{R6}	E_{A6}	E_{C6}	M_{R6}	M_{A6}	M_{C6}	E_{R5}	E_{A5}	E_{C5}	M_{R5}	M_{A5}	M_{C5}	PE_{R5}	PE_{A5}	PE_{C5}	$ABIL_5$	$PEER_6$	ABS_6
E_{R6}	256 (.3568)	256	256	238	245	245	242	242	242	230	239	239	210	210	210	210	249	240
E_{A6}	.14138 (.0619)	256 (.5370)	256	238	245	245	242	242	242	230	239	239	210	210	210	210	249	240
E_{C6}	.15711 (.0503)	.07976 (.0313)	256 (.2870)	238	245	245	242	242	242	230	239	239	210	210	210	210	249	240
M_{R6}	.31926 (.0990)	.29912 (.1138)	.05282 (.0147)	269 (.2695)	269	269	248	248	248	259	261	261	204	204	204	204	251	263
M_{A6}	.13082 (.0432)	.43563 (.1767)	.15546 (.0461)	.44635 (.1282)	276 (.3064)	276	255	255	255	259	268	268	211	211	211	211	258	270
M_{C6}	.11589 (.0451)	.18507 (.0862)	.34218 (.1194)	.27818 (.0940)	.28542 (.1011)	276 (.4242)	255	255	255	259	268	268	211	211	211	211	258	270
E_{R5}	.39366 (.1234)	.05975 (.0230)	.12112 (.0341)	.19199 (.0523)	.08418 (.0245)	.01380 (.0047)	270 (.2755)	270	270	247	255	255	216	217	217	217	253	249
E_{A5}	-.00542 (-.0021)	.35317 (.1650)	-.00570 (-.0019)	.14130 (.0468)	.12199 (.0431)	.08921 (.0370)	-.01271 (-.0043)	270 (.4065)	270	247	255	255	216	217	217	217	253	249
E_{C5}	.17557 (.0644)	.05636 (.0254)	.36085 (.1187)	.08182 (.0261)	.07503 (.0255)	.29087 (.1163)	.11448 (.0369)	-.03831 (-.0150)	270 (.3769)	247	255	255	216	217	217	217	253	249
M_{R5}	.42882 (.1335)	.22089 (.0844)	.14217 (.0397)	.52276 (.1415)	.34099 (.0984)	.14964 (.0508)	.23476 (.0643)	.12593 (.0419)	.08071 (.0258)	259 (.2720)	259	259	203	203	203	203	240	253
M_{A5}	.12949 (.0393)	.37243 (.1387)	-.05707 (-.0155)	.27836 (.0734)	.39991 (.1125)	.05035 (.0167)	.03394 (.0091)	.23034 (.0746)	-.03604 (-.0112)	.36381 (.0964)	268 (.2582)	268	211	211	211	211	251	262
M_{C5}	.14752 (.0499)	.17066 (.0708)	.30516 (.0925)	.22041 (.0647)	.24668 (.0773)	.55218 (.2035)	.08346 (.0248)	.08168 (.0295)	.26987 (.0937)	.30209 (.0891)	.22829 (.0656)	268 (.3201)	211	211	211	211	251	262
PE_{R5}	.38116 (.1305)	.17012 (.0715)	.03180 (.0098)	.52577 (.1565)	.24662 (.0783)	.24658 (.0921)	.28363 (.0854)	.07642 (.0279)	.08404 (.0296)	.46502 (.1390)	.19194 (.0559)	.26905 (.0873)	222 (.3287)	222	222	222	212	206
PE_{A5}	.12297 (.0365)	.32608 (.1186)	.04577 (.0122)	.31940 (.0823)	.27636 (.0759)	.13177 (.0426)	.08378 (.0218)	.35351 (.1119)	-.03710 (-.0113)	.28389 (.0735)	.35569 (.0897)	.14833 (.0417)	.33407 (.0951)	223 (.2464)	223	223	213	206
PE_{C5}	.21448 (.0752)	.09672 (.0416)	.23144 (.0727)	.26667 (.0812)	.25412 (.0825)	.34013 (.1300)	.12541 (.0386)	.10822 (.0405)	.25279 (.0911)	.19171 (.0587)	.23069 (.0688)	.25488 (.0846)	.33867 (.1139)	.32142 (.0936)	223 (.3442)	223	213	206
$ABIL_5$	.34858 (.1876)	.[illegible]4471 (.1[illegible])	.09076 (.0438)	.39531 (.1849)	.32673 (.1629)	.21662 (.1271)	.23758 (.1124)	.17785 (.1022)	.14708 (.0814)	.42518 (.1998)	.26930 (.1233)	.21118 (.1077)	.57594 (.2975)	.50288 (.2249)	.33324 (.1762)	223 (.8118)	213	206
$PEER_6$	.12372 (.0218)	.17847 (.0386)	.04191 (.0066)	.26678 (.0409)	.25430 (.0415)	.21161 (.0407)	-.03051 (-.0047)	.13623 (.0256)	.14691 (.0266)	.15762 (.0242)	.12181 (.0183)	.13725 (.0229)	.23472 (.0397)	.23729 (.0347)	.22793 (.0394)	.24370 (.0648)	271 (.0870)	254
ABS_6	.03330 (.1516)	-.01275 (-0712)	.04075 (.1664)	.04195 (.1660)	.07356 (.3104)	.19033 (.9451)	.02055 (.0823)	.06183 (.3006)	.10633 (.4976)	-.05913 (-.2351)	-.06855 (-.2656)	.04478 (.1932)	-.02519 (-.1101)	.00091 (.0034)	.05072 (.2269)	.00589 (.0405)	.06202 (.1395)	271 (58.1223)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.7

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 1, Integrated Lower-Class School (Corresponding to Model in Figures 5.6 and 6.1I)

	$ABIL_1$	PE_{R1}	PE_{A1}	PE_{C1}	E_{R1}	E_{A1}	E_{C1}	M_{R1}	M_{A1}	M_{C1}	RACE	SEX	IQ
$ABIL_1$	241 (.5145)	241	241	240	213	213	213	217	219	217	236	241	114
PE_{R1}	.44953 (.2459)	348 (.5814)	348	347	303	304	304	281	323	320	342	348	219
PE_{A1}	.45519 (.2430)	.56895 (.3229)	349 (.5540)	348	304	305	305	282	324	321	343	349	220
PE_{C1}	.04867 (.0230)	.16319 (.0820)	.12678 (.0621)	348 (.4338)	303	304	304	281	323	320	342	348	219
E_{R1}	.06171 (.0335)	.00993 (.0057)	.07383 (.0416)	.04656 (.0232)	364 (.5738)	364	364	288	338	336	357	364	226
E_{A1}	.07805 (.0404)	.10260 (.0564)	.12906 (.0693)	-.02073 (-.0098)	.00313 (.0017)	365 (.5198)	365	288	339	336	357	365	226
E_{C1}	.03101 (.0085)	.00852 (.0025)	.00307 (.0009)	-.00117 (-.0003)	.19045 (.0553)	.09885 (.0273)	365 (.1468)	288	339	336	357	365	226
M_{R1}	.34885 (.1936)	.44710 (.2637)	.33066 (.1904)	-.05030 (-.0256)	.01223 (.0072)	.05075 (.0283)	-.12932 (-.0383)	341 (.5983)	337	334	339	341	199
M_{A1}	.32622 (.1684)	.33816 (.1855)	.32444 (.1737)	.10250 (.0486)	.03607 (.0197)	.10455 (.0542)	-.08441 (-.0233)	.60471 (.3365)	397 (.5177)	393	393	397	248
M_{C1}	.11573 (.0567)	.18105 (.0944)	.18106 (.0921)	.26800 (.1206)	.09359 (.0485)	.03224 (.0159)	.02138 (.0056)	.17643 (.0933)	.32907 (.1618)	393 (.4672)	390	393	248
RACE	.08047 (.0285)	.01705 (.0064)	.07816 (.0288)	.14431 (.0470)	.01497 (.0056)	.00259 (.0009)	.05287 (.0100)	-.01561 (-.0060)	.05485 (.0195)	.08767 (.0296)	582 (.2444)	582	280
SEX	-.06363 (-.0228)	-.11768 (-.0449)	-.09438 (-.0351)	-.12619 (-.0416)	-.14736 (-.0558)	-.01623 (-.0059)	-.06054 (-.0116)	.00872 (.0034)	-.05969 (-.0215)	-.30877 (-.1056)	.00509 (.0013)	(.2502)	281
IQ	.35733 (4.1025)	.30389 (3.7088)	.33935 (4.0428)	.06452 (.6801)	.04295 (.5208)	.14094 (1.6264)	.06225 (.3818)	.53648 (6.6419)	.39991 (4.6054)	.18215 (1.9927)	.17512 (1.3858)	.07933 (.6351)	281 (-256.1856)

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[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.8

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 2, Integrated Lower-Class School (Corresponding to Model in Figures 5.7 and 6.2I)

	E_{R2}	E_{A2}	E_{C2}	M_{R2}	M_{A2}	M_{C2}	E_{R1}	E_{A1}	E_{C1}	M_{R1}	M_{A1}	M_{C1}	PE_{R1}	PE_{A1}	PE_{C1}	$ABIL_1$	$PEER_1$	ABS_1	RACE
E_{R2}	350 (.5654)	350	350	337	341	340	287	287	287	275	322	319	294	295	294	195	297	342	348
E_{A2}	.13487 (.0835)	351 (.6777)	351	338	342	341	288	288	288	275	323	320	295	296	295	195	277	343	349
E_{C2}	.13701 (.0577)	.20010 (.0922)	352 (.3134)	339	343	342	289	289	289	276	324	321	296	297	296	196	277	344	350
M_{R2}	.12005 (.0920)	.11280 (.0946)	.10803 (.0616)	404 (1.0388)	400	399	320	320	320	323	372	369	313	314	313	209	308	401	402
M_{A2}	.08576 (.0576)	.17647 (.1298)	.08145 (.0407)	.64269 (.5851)	408 (.7978)	406	327	327	327	326	378	375	317	318	317	213	314	404	406
M_{C2}	.05489 (.0286)	.00144 (.0008)	.24589 (.0954)	.39602 (.2799)	.43205 (.2676)	411 (.4808)	330	330	330	329	381	379	319	320	319	215	315	407	409
E_{R1}	.10199 (.0581)	.09788 (.0610)	.08097 (.0343)	.09627 (.0743)	-.06053 (-.0410)	.07431 (.0390)	364 (.5738)	364	364	288	338	336	303	304	303	213	277	336	357
E_{A1}	.07286 (.0395)	.13064 (.0775)	.05249 (.0212)	.14439 (.1061)	.19723 (1270)	.14863 (.0743)	.00313 (.0017)	365 (.5198)	365	288	339	336	304	305	304	213	277	336	357
E_{C1}	.09657 (.0278)	.00195 (.0006)	.15474 (.0332)	-.02939 (-.0115)	-.08296 (-.0284)	.02817 (.0075)	.19045 (.0553)	.09885 (.0273)	365 (.1468)	288	339	336	304	305	304	213	277	336	357
M_{R1}	.02243 (.0130)	.12294 (.0783)	.01454 (.0063)	.65381 (.5154)	.57016 (.3939)	.20638 (.1107)	.01223 (.0072)	.05075 (.0283)	-.12932 (-.0383)	341 (.5983)	337	334	281	282	281	217	261	337	339
M_{A1}	.06745 (.0365)	.08920 (.0528)	.04445 (.0179)	.52858 (.3876)	.61769 (.3970)	.33596 (.1676)	.03607 (.0197)	.10455 (.0543)	-.08441 (-.0233)	.60471 (.3365)	397 (.5177)	393	323	324	323	219	301	386	393
M_{C1}	.06337 (.0326)	-.01239 (-.0070)	.09971 (.0382)	.30139 (.2100)	.32900 (.2009)	.66847 (.3168)	.09627 (.0485)	.03224 (.0159)	.02138 (.0056)	.17643 (.0933)	.32907 (.1618)	393 (.4672)	320	321	320	217	299	383	390
PE_{R1}	.08561 (.0491)	-.02029 (-.0127)	.07905 (.0337)	.47051 (.3656)	.38037 (.2591)	.27964 (.1478)	.00993 (.0057)	.10260 (.0564)	.00852 (.0025)	.44710 (.2637)	.33816 (.1855)	.18105 (.0944)	348 (.5814)	348	347	241	260	324	342
PE_{A1}	.09494 (.0531)	-.01417 (-.0087)	.06189 (.0258)	.38468 (.2918)	.30643 (.2037)	.23167 (.1196)	.07383 (.0416)	.12906 (.0693)	.00307 (.0009)	.33066 (.1904)	.32444 (.1737)	.18106 (.0921)	.56895 (.3229)	349 (.5540)	348	241	261	325	343
PE_{C1}	.00893 (.0044)	.02569 (.0139)	.05998 (.0221)	.05895 (.0396)	.11448 (.0673)	.28463 (.1300)	.04656 (.0232)	-.02073 (-.0098)	-.00117 (-.0003)	-.05030 (-.0256)	.10250 (.0486)	.26800 (.1206)	.16319 (.0820)	.12678 (.0621)	348 (.4338)	240	261	324	342
$ABIL_1$	.05480 (.0296)	.06712 (.0396)	.08521 (.0342)	.28291 (.2068)	.29415 (.1885)	.15354 (.0764)	.06171 (.0335)	.07805 (.0404)	.03101 (.0085)	.34885 (.1936)	.32622 (.1684)	.11573 (.0567)	.44953 (.2459)	.45519 (.2430)	.04867 (.0230)	241 (.5145)	173	219	236
$PEER_1$	.06862 (.0156)	.07670 (.0191)	.02286 (.0039)	.33356 (.1027)	.37395 (.1009)	.15857 (.0332)	.01887 (.0043)	-.00373 (-.0008)	-.05393 (-.0062)	.37528 (.0877)	.35112 (.0763)	.13541 (.0280)	.21051 (.0485)	.14036 (.0316)	.07185 (.0143)	.03017 (.0065)	327 (.0913)	318	326
ABS_1	.13094 (1.8536)	.11997 (1.8595)	.12450 (1.3122)	.33858 (6.4972)	.29614 (4.9802)	.04928 (.6433)	.06308 (.8997)	.01994 (.2707)	-.04954 (-.3575)	.27397 (3.9899)	.28806 (3.9022)	.08563 (1.1020)	.22684 (3.2567)	.22527 (3.1569)	-.02682 (-.3325)	.16332 (2.2058)	.08434 (.4799)	422 (354.4936)	420
RACE	-.04750 (-.0177)	.01061 (.0043)	.00504 (.0014)	.00349 (.0018)	.09319 (.0412)	.14718 (.0505)	.01497 (.0056)	.00259 (.0009)	.05287 (.0100)	-.01561 (-.0060)	.05485 (.0195)	.08767 (.0296)	.01705 (.0064)	.07816 (.0288)	.14431 (.0470)	.08047 (.0285)	-.06459 (-.0096)	-.02999 (-.2792)	582 (.2444)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.9

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 3, Integrated Lower-Class School (Corresponding to Model in Figures 5.8 and 6.3I)

	$ABIL_3$	FE_{R3}	FE_{A3}	FE_{C3}	E_{R3}	E_{A3}	E_{C3}	M_{R3}	M_{A3}	M_{C3}	E_{R2}	E_{A2}	E_{C2}	M_{R2}	M_{A2}	M_{C2}	RACE	SEX	IQ	$ABIL_1$	FE_{R1}	FE_{A1}	FE_{C1}
$ABIL_3$	258 (.6744)	255	257	258	224	222	223	197	228	228	188	189	189	203	208	208	255	258	187	100	179	180	179
FE_{R3}	.46345 (.2825)	257 (.5512)	257	257	224	222	223	195	226	226	187	188	188	202	207	207	253	257	186	101	179	180	179
FE_{A3}	.27575 (.1547)	.58070 (.2945)	259 (.4668)	259	224	222	223	196	228	228	188	189	189	203	208	208	255	259	187	101	180	181	180
FE_{C3}	.09774 (.0532)	.22029 (.1143)	.19163 (.0915)	260 (.4385)	225	223	224	197	229	229	189	190	190	204	209	209	256	260	188	101	180	181	180
E_{R3}	.00111 ([illegible])	.05337 (.0296)	.04785 (.0244)	.01097 (.0057)	297 (.5579)	284	285	218	253	253	220	221	221	236	242	242	284	286	220	112	195	196	195
E_{A3}	-.00254 (-.0016)	.08199 (.0477)	.08757 (.0468)	-.04391 (-.0240)	-.05259 (-.0308)	284 (.6129)	284	216	251	251	218	219	219	234	240	240	282	284	218	111	193	194	193
E_{C3}	-.03429 (-.0177)	[illegible]	.05011 (.0215)	.21396 (.0941)	.20388 (.0958)	.01272 (.0063)	285 (.3961)	217	252	252	219	220	220	235	241	241	283	285	219	111	194	195	194
M_{R3}	.38262 (.2679)	[illegible] (.3141)	.38611 (.2249)	.25324 (.1509)	.10522 (.0670)	.16135 (.1077)	.09364 (.0502)	242 (.7269)	241	242	169	170	170	190	192	192	240	242	183	77	152	153	152
M_{A3}	.25151 (.1430)	.38384 (.1973)	.33378 (.1579)	.16994 (.0782)	.13333 (.0690)	.15354 (.0832)	.01646 (.0072)	.59909 (.3537)	287 (.4796)	287	204	205	205	221	227	227	284	287	216	109	184	185	184
M_{C3}	.13169 (.0780)	.16508 (.0896)	.11613 (.0580)	.40028 (.2045)	.10531 (.0578)	-.12017 (-.0688)	.25641 (.1180)	.57411 (.2254	.30344 (.1536)	288 (.5342)	204	205	205	221	227	227	285	288	216	109	184	185	184
E_{R2}	.12416 (.0767)	.16819 (.0939)	-.02085 (-.0107)	-.03227 (-.0170)	.20777 (.1167)	.11860 (.0698)	.09162 (.0434)	.05489 (.0784)	.15059 (.0784)	.03960 (.0218)	350 (.5651)	350	350	337	341	340	348	350	234	195	294	295	294
E_{A2}	.04267 (.0288)	.08842 (.0540)	.01908 (.0107)	-.06832 (-.0393)	.11412 (.0702)	.33719 (.2173)	.04977 (.0258)	.00144 (.0904)	.06011 (.0343)	-.05603 (-.0337)	.13487 (.0835)	351 (.6777)	351	338	342	341	349	351	235	195	295	296	295
E_{C2}	-.00858 (-.0040)	.12921 (.0537)	-.02515 (-.0096)	.08348 (.0327)	.15167 (.0634)	.10401 (.0456)	.14725 (.0579	.24589 (.0785)	.15157 (.0588)	.11796 (.0483)	.13701 (.0577)	.20010 (.0922)	352 (.3134)	339	343	342	350	352	235	196	296	297	296
M_{R2}	.33151 (.2775)	.40789 (.3086)	.37895 (.2639)	.12147 (.0565)	.07910 (.0602)	.04310 (.0344)	-.02959 (-.0190)	.74266 (.6454)	.56726 (.4004)	.27183 (.2025)	.12005 (.0920)	.11280 (.0946)	.10803 (.0616)	404 (1.0388)	400	399	402	404	256	209	313	314	313
M_{A2}	.36683 (.2691)	.47114 (.3124)	.34892 (.2129)	.19609 (.1224)	.06753 (.0451)	.13226 (.0925)	.03526 (.0198)	.62117 (.4730)	.56051 (.3467)	.26088 (.1703)	.08576 (.0578)	.17647 (.1298)	.08145 (.0407)	.64269 (.5851)	408 (.7978)	406	406	408	256	213	317	318	317
M_{C2}	.18072 ([illegible])	.28615 (.1473)	.25612 (.1213)	.43218 (.1984)	-.02112 (-.0109)	-.03146 (-.0171)	.19953 (.0871)	.42381 (.2506)	.38226 (.1836)	.57411 (.2910)	.05489 (.0285)	.00144 (.0008)	.24589 (.0954)	.39602 (.2799)	.43205 (.2676)	411 (.4808)	409	411	264	215	319	320	319
RACE	[illegible]	[illegible]	.19678 (.0665)	[illegible]	.00411 (.0015)	-.05961 (-.0215)	-.06410 (-.0199)	.11298 (.0476)	.19588 (.0671)	.16370 (.0532)	-.04750 (-.0177)	01061 (.0043)	.00504 (.0014)	.00349 (.0018)	.09319 (.0412)	.14718 (.0505)	582 (.2444)	582	280	236	342	343	342
SEX	[illegible]	[illegible]	[illegible]	-.31989 ([illegible])	-.07091 (-.0265)	.01897 (.0074)	-.13121 (-.0413)	-.16187 (-.0690)	-.05624 (-.0195)	-.20389 (-.0745)	-.11303 (-.0425)	.01542 (.0063)	.03099 (.0087)	-.10260 (-.0523)	-.10895 (-.0487)	-.31547 (-.1094)	.00509 (.0013	(.2502)	281	241	348	349	[illegible]
IQ	[illegible]	[illegible]	[illegible]	[illegible]	-.05398 (-.4441)	.06390 (.8007)	-.18829 (-1.8968)	.35356 (4.8249)	.44273 (4.9073)	.25731 (3.0102)	.06067 (.7302)	.14088 (1.8562)	.13535 (1.2128	.47964 (7.8245)	.42571 (6.0861)	.25730 (2.8556)	.17512 (1.3858)	.07933 (.6351)	281 (-256.1856)	114	219	220	219
$ABIL_1$	[illegible]	[illegible]	.14071 ([illegible])	.17840 ([illegible])	-.07399 (-.0396)	.00769 (.0043)	-.18482 (-.0834)	.36963 (.2261)	.26606 (.1322)	.14792 (.0771)	.05480 (.0296)	.06712 (.0396)	.08521 (.0342)	.28291 (.2068)	.29415 (.1885)	.15354 (.0754)	.08047 (.0285)	-.06363 (-.0228)	-.35733 (-4.1025)	241 (.5145)	241	241	240
FE_{R1}	[illegible]	[illegible]	[illegible]	.19770 ([illegible])	.05447 (.0310)	.05969 (.0356)	-.06810 (-.0327)	.43052 (.2799)	.33162 (.1751)	.23876 (.1331)	.08561 (.0491)	-.02029 (-.0127)	.07905 (.0337)	.47051 (.3656)	.38037 (.2591)	.27964 (.1478)	.01705 (.0064)	-.11768 (-.0049)	-.30389 (-3.7088)	.44953 (.2459)	348 (.5814)	348	[illegible]
FE_{A1}	.23558 (.1440)	.27443 (.1516)	.33073 (.1682)	.14910 (.0735)	.02581 (.0143)	.06494 (.0378)	-.11107 (.0520)	.32364 (.2054)	.29288 (.1510)	.23931 (.1302)	.09494 (.0531)	-.01417 (-.0087	.06189 (.0258)	.38468 (.2918)	.30643 (.2037)	.23167 (.1196)	.07816 (.0288)	-.09438 (-.0351)	-.33935 (-4.0428)	.45519 (.2430)	.56895 (.3229)	349 (.5540)	[illegible]
FE_{C1}	.13911 ([illegible])	[illegible]	.05335 ([illegible])	[illegible]	-.11915 ([illegible])	-.02630 (-.0136)	.08420 (.0349)	.12841 (.0721)	.03885 (.0177)	.31185 (.1501)	.00893 (.0044)	.02569 (.0139)	.05998 (.0221)	.05895 (.0396)	.11448 (.0673)	.28463 (.1300)	.14431 (.0470)	-.12619 (-.0416)	-.06452 (-.6801)	.04867 (.0230)	.16319 ([illegible])	[illegible]	[illegible]

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[a] Covariances in parentheses.

[b] Variances on diagonal.

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Table 6A.10

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 4,
Integrated Lower-Class School (Corresponding to Model in Figures 5.9 and 6.4I)

	E_{R4}	E_{A4}	E_{C4}	M_{R4}	M_{A4}	M_{C4}	E_{R3}	E_{A3}	E_{C3}	M_{R3}	M_{A3}	M_{C3}	PE_{R3}	PE_{A3}	PE_{C3}	$ABIL_3$	$PEER_4$	ABS_4	RACE
E_{R4}	245 (.5624)	245	245	232	238	237	210	208	209	200	228	229	208	210	210	209	190	235	244
E_{A4}	-.06127 (-.0360)	245 (.6121)	245	232	238	237	210	208	209	200	228	229	208	210	210	209	190	235	244
E_{C4}	.08801 (.0383)	-.04603 (-.0209)	245 (.3366)	232	238	237	210	208	209	200	228	229	208	210	210	209	190	235	244
M_{R4}	.05535 (.0394)	.10998 (.0816)	-.08939 (-.0492)	297 (.9000)	295	294	248	246	247	241	278	279	222	223	224	223	197	292	295
M_{A4}	.07200 (.0456)	.20040 (.1323)	-.01457 (-.0071)	.58018 (.4645)	302 (.7123)	301	251	249	250	241	283	284	226	228	229	228	203	297	300
M_{C4}	-.01783 (-.0108)	-.01153 (-.0073	.17928 (.0841)	.29849 (.2290)	.34705 (.2368)	301 (.6538)	251	249	250	241	283	284	226	228	229	228	202	296	299
E_{R3}	.19706 (.1104)	.08289 (.0484)	.02490 (.0108)	.07986 (.0566)	.15400 (.0971)	.03591 (.0217)	286 (.5579)	284	285	218	253	253	224	224	225	224	176	252	284
E_{A3}	.10789 (.0633)	.20290 (.1243)	.04924 (.0224)	.15119 (.1123)	.20502 (.1355)	-.01942 (-.0123)	-.05259 (-.0308)	284 (.6129)	284	216	251	251	222	222	223	222	174	250	282
E_{C3}	-.01699 (-.0080)	.07798 (.0384)	.22840 (.0834)	.08851 (.0528)	.05093 (.0271)	.17229 (.0877)	.20388 (.0958)	.01272 (.0063)	285 (.3961)	217	252	252	223	223	224	223	175	251	283
M_{R3}	.07573 (.0484)	.16495 (.1100)	-.06782 (-.0335)	.61932 (.5009)	.59314 (.4268)	.31034 (.2140)	.10522 (.0670)	.16135 (.1077)	.09364 (.0502)	242 (.7269)	241	242	195	196	197	197	160	238	240
M_{A3}	.04671 (.0243)	.21446 (.1162)	-.11003 (-.0442)	.42994 (.2825)	.68952 (.4030)	.33884 (.1897)	.13333 (.0690)	.15354 (.0832)	.01646 (.0072)	.59909 (.3537)	287 (.4796)	287	226	228	229	228	193	283	284
M_{C3}	-.01117 (-.0061)	.07223 (.0413)	.18969 (.0804)	.24812 (.1721)	.26970 (.1664)	.69933 (.4133)	.10581 (.0578)	-.12017 (-.0688)	.25641 (.1180)	.36170 (.2254)	.30344 (.1536)	388 (.5342)	226	228	229	228	194	284	285
PE_{R3}	-.00934 (-.0052)	.20980 (.1219)	-.06247 (-.0269)	.40207 (.2832)	.41133 (.2577)	.16839 (.1011)	.05337 (.0296)	.08199 (.0477)	.09509 (.0444)	.49616 (.3141)	.38384 (.1973)	.16508 (.0896)	257 (.5512)	257	257	255	164	226	253
PE_{A3}	-.05266 (-.0270)	.23411 (.1251)	-.00163 (-.0006)	.21866 (.1417)	.33184 (.1913)	.07565 (.0418)	.04785 (.0244)	.08757 (.0468)	.05011 (.0215)	.38611 (.2249)	.33378 (.1579)	.11613 (.0580)	.58070 (.2945)	259 (.4668)	259	257	165	228	255
PE_{C3}	-.07182 (-.0376)	.05301 (.0290)	.11020 (.0447)	.16158 (.1071)	.15571 (.0918)	.34858 (.1970)	.01097 (.0057)	-.04391 (-.0240)	.21396 (.0941)	.25324 (.1509)	.16994 (.0822)	.40028 (.2045)	.22029 (.1143)	.19163 (.0915)	260 (.4885)	258	166	229	256
$ABIL_3$	-.03804 (-.0234)	.12691 (.0815)	-.05303 (-.0253)	.29725 (2316)	.32357 (.2243)	.17429 (.1157)	.00111 (.0007)	-.00254 (-.0016)	-.03429 (-.0177)	.38262 (.2679)	.25151 (.1430)	.13169 (.0790)	.46345 (.2825)	.27575 (.1547)	.09274 (.0532)	258 (.6744)	165	228	255
$PEER_4$	.12849 (.0302)	-.02975 (-.0073)	-.03805 (-.0069)	.27958 (.0832)	.41349 (.1095)	.10488 (.0266)	.00853 (.0020)	.03214 (.0079)	-.14722 (-.0291)	.30323 (.0811)	.36379 (.0790)	.00230 (.0005)	.24767 (.0577)	.06640 (.0142)	-.01110 (-.0024)	.21722 (.0560)	211 (.0984)	204	211
ABS_4	.14204 (1.8698)	.01292 (.1774)	.01351 (.1376)	.15799 (2.6312)	.18208 (2.6976)	-.06428 (-.9124)	-.09695 (-1.2712)	.05531 (.7601)	.01852 (.2046)	.16920 (2.5324)	.08556 (1.0401)	-.00793 (-.1018)	.13498 (1.7591)	.07925 (.9505)	-.00579 (-.0710)	.07246 (1.0445)	.15051 (.8289)	307 (308.1570)	304
RACE	-.03347 (-.0124)	.08537 (.0330)	.08481 (.0243)	.05876 (.0276)	.17144 (.0715)	.20014 (.0800)	.00411 (.0015)	-.05561 (-.0215)	-.06410 (-.0199)	.11298 (.0476)	.19588 (.0671)	.16370 (.0592)	.09994 (.0367)	.19678 (.0665)	.10582 (.0366)	.08752 (.0355)	-.07107 (-.0110)	-.08214 (-.7129)	582 (.244

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.11

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 5, Integrated Lower-Class School (Corresponding to Model in Figures 5.10 and 6.5I)

	$ABIL_5$	PE_{R5}	PE_{A5}	PE_{C5}	E_{R5}	E_{A5}	E_{C5}	M_{R5}	M_{A5}	M_{C5}	E_{R4}	E_{A4}	E_{C4}	M_{R4}	M_{A4}	M_{C4}	RACE	SEX	IQ	$ABIL_3$	PE_{R3}	PE_{A3}	PE_{C3}
$ABIL_5$	171 (.6861)	168	168	169	162	163	163	121	152	151	121	121	121	143	148	148	168	171	120	114	113	114	114
PE_{R5}	.40140 (.2677)	170 (.6482)	170	170	161	162	162	119	151	150	120	120	120	142	147	147	168	170	121	115	114	115	115
PE_{A5}	.34180 (.2073)	.63167 (.3724)	170 (.5361)	170	161	162	162	119	151	150	120	120	120	142	147	147	168	170	121	115	114	115	115
PE_{C5}	.25927 (.1345)	.23264 (.1173)	.19319 (.0886)	171 (.3980)	162	163	163	120	152	151	120	120	120	142	147	147	169	171	122	115	114	115	115
E_{R5}	.14008 (.0908)	.05783 (.0364)	.08891 (.0509)	.21788 (.1067)	211 (.6123)	211	211	141	183	183	143	143	143	171	176	176	209	211	144	139	138	140	140
E_{A5}	.15410 (.1087)	.03638 (.0249)	.09364 (.0584)	-.10823 (-.0577)	-.06271 (-.0418)	212 (.7252)	212	142	184	184	144	144	144	172	177	177	210	212	145	140	139	141	141
E_{C5}	.08501 (.0390)	.08445 (.0377)	-.04067 (-.0165)	.31969 (.1096)	.20438 (.0887)	-.05202 (-.0246)	212 (.3075)	142	184	184	144	144	144	172	177	177	210	212	145	140	139	141	141
M_{R5}	.38697 (.2878)	.55658 (.4023)	.41093 (.2701)	.17662 (.0993)	.15492 (.1088)	.07612 (.0582)	.02924 (.0146)	156 (.8060)	153	153	101	101	101	123	127	127	194	156	117	97	95	97	97
M_{A5}	.24123 (.1631)	.24478 (.1608)	.36610 .2188)	.05123 (.0262)	.05849 (.0374)	.18975 (.1319)	-.01950 (-.0088)	.55175 (.4044)	204 (.6665)	203	137	137	137	164	168	168	202	204	157	132	130	132	132
M_{C5}	.19236 (.0941)	.31434 (.1495)	.22400 (.0969)	.34532 (.1278)	.17268 (.0798)	.04301 (.0216)	.26733 (.0876)	.33959 (.1802)	.31739 (.1531)	205 (.3492)	136	136	136	164	168	168	203	205	157	131	129	131	131
E_{R4}	.06369 (.0396)	.01436 (.0087)	-.11065 (-.0609)	-.00552 (-.0026)	.19809 (.1162)	.05835 (.0373)	.15749 (.0655)	.13971 (.0941)	-.02962 (-.0181)	-.07259 (-.0322)	245 (.5624)	245	245	232	238	237	244	245	111	209	208	210	210
E_{A4}	.05302 (.0344)	.12835 (.0809)	.38715 (.1874)	.04004 (.0196)	-.00026 (-.0002)	.16484 (.1098)	.00340 (.0015)	.02328 (.0164)	.09305 (.0594)	-.15570 (-.0720)	-.06127 (-.0360)	245 (.6121)	245	232	238	237	244	245	111	209	208	210	210
E_{C4}	-.04199 (-.0202)	.02731 (.0128)	-.10545 (-.0448)	.20114 (.0731)	.11737 (.0533)	-.02514 (-.0124)	.34323 (.1104)	-.03825 (-.0199)	-.03236 (-.0153)	.16119 (.0553)	.08801 (.0383)	-.04603 (-.0209)	245 (.3366)	232	238	237	244	245	111	209	208	210	210
M_{R4}	.31190 (.2451)	.29864 (.2281)	.22206 (.1543)	.17726 (.1053)	.08837 (.0656)	.05614 (.0454)	.10475 (.0551)	.60287 (.5135)	.58698 (.4546)	.21316 (.1195)	.05535 (.0394)	.10998 (.0816)	-.08939 (-.0492)	297 (.9000)	295	294	295	297	128	223	222	223	224
M_{A4}	.28459 (.1990)	.39490 (.2623)	.39269 (.2427)	.14919 (.0788)	-.01913 (-.0126)	.12779 (.0918)	.07998 (.0356)	.59041 (.4474)	.54494 (.3795)	.24432 (.1218)	.07200 (.0496)	.20040 (.1323)	-.01457 (-.0071)	.58018 (.4645)	302 (.7123)	301	300	302	132	228	226	228	229
M_{C4}	.31897 (.2136)	.32186 (.2095)	.18300 (.1083)	.49243 (.2493)	.11309 (.0716)	-.01488 (-.0102)	.32115 (.1440)	.39303 (.2853)	.20443 (.1349)	.50811 (.2428)	-.01783 (-.0108)	-.01153 (-.0073)	.17928 (.0841)	.29849 (.2290)	.34705 (.2368)	301 (.6538)	299	301	131	228	226	228	229
RACE	.02385 (.0098)	-.05134 (-.0204)	.03860 (.0140)	.10685 (.0331)	-.02278 (-.0088)	-.07665 (-.0323)	.04543 (.0125)	.02689 (.0119)	.15156 (.0612)	.13925 (.0407)	-.03347 (-.0124)	.08537 (.0330)	.08481 (.0243)	.05876 (.0276)	.17144 (.0715)	.20014 (.0800)	582 (.2444)	582	164	255	253	255	256
SEX	-.07133 (-.0296)	-.20581 (-.0829)	-.11421 (-.0418)	-.22332 (-.0699)	-.24877 (-.0974)	.15302 (.0652)	-.25309 (-.0702)	-.19475 (-.0875)	-.00569 (-.0023)	-.19313 (-.0571)	-.05212 (-.0196)	.00231 (.0009)	-.22324 (-.0648)	-.19296 (-.0916)	-.06536 (-.0276)	-.29526 (-.1194)	.00509 (.0013)	(.2502)	164	258	257	259	260
IQ	.21518 (2.3324)	.32638 (3.4387)	.30282 (2.9015)	.25833 (2.1166)	.06288 (.6439)	.04661 (.5195)	.09002 (.6533)	.37780 (4.4387)	.42045 (4.4920)	.26521 (2.0508)	-.14854 (-1.4577)	.08168 (2.4410)	.00571 (.0434)	.48753 (6.0527)	.47733 (5.2758)	.28729 (3.0400)	.18855 (1.2199)	-.03303 (-.2162)	164 (-171.2539)	107	105	107	107
$ABIL_3$	.26998 (.1836)	.44275 (.2927)	.36201 (.2177)	.06048 (.0311)	-.04878 (-.0313)	.02898 (.0203)	-.01747 (-.0080)	.18579 (.1370)	.06841 (.0459)	-.00560 (-.0027)	-.03804 (-.0234)	.12691 (.0815)	-.05303 (-.0253)	.29725 (.2316)	.32357 (.2243)	.17429 (.1157)	.08752 (.0355)	-.00947 (-.0039)	-.16615 (-1.7856)	258 (.6744)	255	257	258
PE_{R3}	.29421 (.1809)	.23112 (.1381)	.24831 (.1390)	.07872 (.0366)	.08841 (.0514)	.00271 (.0017)	-.00923 (-.0038)	.37921 (.2528)	.23290 (.1412)	.02107 (.0092)	-.00934 (-.0052)	.20980 (.1219)	-.06247 (-.0269)	.40207 (.2832)	.41133 (.2577)	.16839 (.1011)	.09994 (.0367)	-.11902 (-.0442)	-.38537 (-3.7440)	.46345 (.2825)	257 (.5512)	257	257
PE_{A3}	.18362 (.1039)	.19890 (.0874)	.39620 (.1982)	-.03121 (-.0133)	.01105 (.0059)	-.03533 (-.0206)	-.19390 (-.0735)	.13767 (.0844)	.24101 (.1344)	-.01392 (-.0056)	-.05266 (-.0270)	.23411 (.1251)	-.00163 (-.0006)	.21866 (.1417)	.33184 (.1913)	.07565 (.0418)	.19678 (.0665)	-.02882 (-.0098)	-.16931 (-1.5137)	.27575 (.1547)	.58070 (.2945)	259 (.4668)	259
PE_{C3}	.09644 (.0558)	.23237 (.1308)	.28373 (.1452)	.27864 (.1219)	-.04793 (-.0262)	-.02229 (-.0133)	.07593 (.0294)	.12243 (.0768)	.10657 (.0608)	.16023 (.0662)	-.07182 (-.0376)	.05301 (.0290)	-.11020 (.0447)	.16158 (.1071)	.15571 (.0918)	.34858 (.1970)	.10582 (.0366)	-.31989 (-.1118)	-.05403 (-.4942)	.09274 (.0532)	.22029 (.1143)	.19163 (.0915)	260 (.4885)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.12

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 6, Integrated Lower-Class School (Corresponding to Model in Figures 5.11 and 6.6I)

	E_{R6}	E_{A6}	E_{C6}	M_{R6}	M_{A6}	M_{C6}	E_{R5}	E_{A5}	E_{C5}	M_{R5}	M_{A5}	M_{C5}	PE_{R5}	PE_{A5}	PE_{C5}	$ABIL_5$	$PEER_6$	ABS_6	RACE
E_{R6}	151 (.6195)	151	151	148	149	150	135	136	136	115	147	147	134	134	135	135	141	144	150
E_{A6}	-.00691 (-.0045)	151 (.6986)	151	148	149	150	135	136	136	115	147	147	134	134	135	135	141	144	150
E_{C6}	.15317 (.0722)	.11416 (.0571)	151 (.3584)	148	149	150	135	136	136	115	147	147	134	134	135	135	141	144	150
M_{R6}	.07599 (.0496)	.07775 (.0539)	.03712 (.0184)	214 (.6877)	206	208	184	185	185	152	200	200	153	153	154	154	160	204	213
M_{A6}	.02285 (.0179)	.31452 (.2611)	-.10198 (-.0606)	.54848 (.4517)	209 (.9862)	207	180	181	181	151	198	199	149	149	150	150	158	200	203
M_{C6}	.13366 (.0683)	.07223 (.0392)	.15683 (.0609)	.31420 (.1691)	.29525 (.1903)	211 (.4212)	182	183	183	150	200	200	150	150	151	151	159	202	210
E_{R5}	.13311 (.0820)	.08123 (.0531)	.31675 (.1484)	.09986 (.0648)	-.04008 (-.0311)	.08856 (.0450)	211 (.6123)	211	211	141	183	183	161	161	162	162	146	186	209
E_{A5}	.00918 (.0062)	.21311 (.1518)	-.00527 (-.0027)	.05661 (.0400)	.14059 (.1189)	.06485 (.0358)	-.06271 (-.0418)	212 (.7252)	212	142	184	184	162	162	163	163	147	187	210
E_{C5}	.05779 (.0252)	-.02459 (-.0114)	.39981 (.1327)	-.00568 (-.0026)	-.12327 (-.0679)	.22906 (.0824)	.20438 (.0887)	-.05202 (-.0246)	212 (.3075)	142	184	184	162	162	163	163	147	187	210
M_{R5}	.13594 (.0961)	.12636 (.0948)	.14163 (.0761)	.89477 (.6662)	.50141 (.4471)	.40148 (.2339)	.15492 (.1088)	.07612 (.0582)	.02924 (.0146)	156 (.8060)	153	153	119	119	120	121	130	151	154
M_{A5}	.01690 (.0109)	.20608 (.1406)	.02657 (.0130)	.57479 (.3892)	.69688 (.5650)	.34095 (.1807)	.05849 (.0374)	.18975 (.1319)	-.01950 (-.0088)	.55175 (.4044)	204 (.6665)	203	151	151	152	152	157	197	202
M_{C5}	.11058 (.0514)	.02038 (.0101)	.16213 (.0574)	.25908 (.1270)	.16513 (.0969)	.64460 (.2472)	.17268 (.0798)	.04301 (.0216)	.26733 (.0876)	.33959 (.1802)	.31739 (.1531)	205 (.3492)	150	150	151	151	156	196	203
PE_{R5}	.12939 (.0820)	-.07950 (-.0535)	.02399 (.0116)	.45609 (.3045)	.23255 (.1859)	.34249 (.1790)	.05783 (.0364)	.03638 (.0249)	.08445 (.0377)	.55658 (.4023)	.24472 (.1608)	.31434 (.1495)	170 (.6482)	170	170	168	135	153	168
PE_{A5}	.07314 (.0422)	.12773 (.0782)	-.05258 (-.0231	.37216 (.2260)	.32029 (.2329)	.23276 (.1106)	.08891 (.0509)	.09364 (.0584)	-.04067 (-.0165)	.41093 (.2701)	.36610 (.2188)	.22400 (.0969)	.63167 (.3724)	170 (.5361)	170	168	135	153	168
PE_{C5}	.02904 (.0143)	.06952 (.0364)	.20322 (.0762)	.12957 (.0673)	.06920 (.0430)	.30381 (.1235)	.21788 (.1067)	-.10823 (-.0577)	.31569 (.1096)	.17662 (.0993)	.05123 (.0262)	.34532 (.1278)	.23264 (.1173)	.19319 (.0886)	171 (.3920)	169	136	154	169
$ABIL_5$	.01499 (.0098)	-.01880 (-.0130)	.07073 (.0351)	.35002 (.2404)	.20907 (.1720)	.18272 (.0982)	.14008 (.0908)	.15410 (.1087)	.08501 (.0390)	.38697 (.2878)	.24123 (.1631)	.19236 (.0941)	.40140 (.2677)	.34180 (.2073)	.25927 (.1345)	171 (.6861)	137	154	169
$PEER_6$	-.03545 (-.0082)	.09816 (.0241)	-.09878 (.0174)	.18329 (.0447)	.27610 (.0807)	.15359 (.0293)	.03445 (.0079)	.17149 (.0430)	-.03165 (-.0052)	.18475 (.0488)	.36315 (.0873)	.16260 (.0283)	.24342 (.0577)	.21213 (.0457)	.01494 (.0028)	.16989 (.0414)	162 (.0866)	157	161
ABS_6	.07688 (1.2353)	.08732 (1.4899)	-.03176 (-.3882	.32261 (5.4619)	.29330 (5.9465)	.11751 (1.5569)	.14347 (2.2919)	.15142 (2.6324)	-.06171 (-.6986)	.28940 (5.3042)	.26134 (4.3558)	.00381 (.0460	.15792 (2.5956)	.08665 (1.2953)	-.01092 (-.1396)	.18685 (3.1595)	.27806 (1.6706)	214 (416.7722)	212
RACE	.07480 (.0291)	.02646 (.0109)	.04617 (.0137)	.03770 (.0155)	.08452 (.0415)	.14677 (.0471)	-.02278 (-.0088)	-.07665 (-.0323)	.04543 (.0125)	.02689 (.0119)	.15156 (.0612)	.13925 (.0401)	-.05134 (-.0204)	.03860 (.0140)	.10685 (.0331)	.02385 (.0098)	-.09667 (-.0141)	-.17522 (-1.7685)	582 (.2444)

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[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.13

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 1, Black Lower-Class School (Corresponding to Model in Figures 5.6 and 6.1B)

	$ABIL_1$	PE_{R1}	PE_{A1}	PE_{C1}	E_{R1}	E_{A1}	E_{C1}	M_{R1}	M_{A1}	M_{C1}	SEX	IQ
$ABIL_1$	96 (.5615)	89	87	91	91	91	91	70	74	78	96	30
PE_{R1}	.47157 (.2737)	90 (.5999)	88	90	85	85	85	65	70	74	90	26
PE_{A1}	.36718 (.1931)	.70009 (.3806)	88 (.4927)	88	83	83	83	63	69	72	88	26
PE_{C1}	.26633 (.1503)	.39078 (.2280)	.32844 (.1737)	92 (.5676)	87	87	87	66	71	75	92	27
E_{R1}	-.03525 (-.0216)	.06144 (.0389)	.05778 (.0331)	-.08617 (-.0530)	260 (.6667)	260	260	202	215	227	260	119
E_{A1}	.13918 (.0880)	.16653 (.1089)	.06239 (.0370)	.17380 (.1105)	.00825 (.0057)	260 (.7123)	260	202	215	227	260	119
E_{C1}	.15420 (.0664)	.04780 (.0213)	.03415 (.0138)	.02157 (.0093)	.18941 (.0889)	.10231 (.0496)	260 (.3303)	202	215	227	260	119
M_{R1}	.17263 (.1121)	.13861 (.0931)	.16662 (.1014)	.12588 (.0822)	.10845 (.0768)	.02520 (.0184)	.06020 (.0300)	220 (.7517)	196	205	220	114
M_{A1}	.33587 (.1659)	.34771 (.1776)	.33738 (.1561)	.05908 (.0293)	.04703 (.0253)	.08568 (.0477)	.11979 (.0454)	.51354 (.2935)	231 (.4347)	229	231	107
M_{C1}	.24244 (.1110)	.21785 (.1031)	.10927 (.0468)	.29242 (.1346)	.05631 (.0281)	.11891 (.0613)	.05526 (.0194)	.16319 (.0864)	.33899 (.1365)	243 (.3731)	243	111
SEX	-.11269 (-.0421)	-.17953 (-.0693)	-.23167 (-.0811)	-.17765 (-.0667)	.00361 (.0015)	-.10000 (-.0421)	-.01832 (-.0053)	-.20492 (-.0886)	-.13119 (-.0431)	-.20081 (-.0612)	(.2486)	187
IQ	.27055 (2.9204)	.10618 (1.1847)	.03681 (.3722)	-.15774 (-1.7120)	.00193 (.0227)	-.10189 (-1.2389)	.03237 (.2680)	.30968 (3.8679)	.51776 (4.9177)	.07564 (.6656)	.03740 (.2687)	187 (-207.5357)

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[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.14

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 2, Black Lower-Class School (Corresponding to Model in Figures 5.7 and 6.2B)

	E_{R2}	E_{A2}	E_{C2}	M_{R2}	M_{A2}	M_{C2}	E_{R1}	E_{A1}	E_{C1}	M_{R1}	M_{A1}	M_{C1}	PE_{R1}	PE_{A1}	PE_{C1}	$ABIL_1$	$PEER_1$	ABS_1
E_{R2}	191 (.6296)	191	191	165	165	172	170	170	170	157	158	166	72	71	73	77	167	174
E_{A2}	.03190 (.0212)	191 (.7046)	191	165	165	172	170	170	170	157	158	166	72	71	73	77	167	174
E_{C2}	.12946 (.0560)	.18832 (.0861)	191 (.2968)	165	165	172	170	170	170	157	158	166	72	71	73	77	167	174
M_{R2}	.12326 (.0763)	.19030 (.1246)	.19142 (.0813)	239 (.6084)	234	238	209	209	209	195	213	220	66	65	67	70	206	236
M_{A2}	.04234 (.0312)	.19540 (.1525)	.12190 (.0617)	.69147 (.5013)	250 (.8640)	249	217	217	217	201	224	230	68	67	69	72	211	246
M_{C2}	.12191 (.0697)	.08990 (.0544)	-.03253 (-.0128)	.31881 (.1792)	.37729 (.2528)	262 (.5196)	226	226	226	207	229	240	74	72	75	78	219	258
E_{R1}	.12272 (.0795)	.09761 (.0669)	.02264 (.0101)	.00190 (.0012)	.07038 (.0534)	.14698 (.0865)	260 (.6667)	260	260	202	215	227	85	83	87	91	209	229
E_{A1}	.08216 (.0550)	.08607 (.0610)	.16771 (.0771)	-.03521 (-.0232)	-.01135) (-.0089)	.05329 (.0324)	.00825 (.0057)	260 (.7123)	260	202	215	227	85	83	87	91	209	229
E_{C1}	.08632 (.0394)	.07834 (.0378)	-.00815 (-.0026)	.06666 (.0299)	.08451 (.0451)	.14262 (.0591)	.18941 (.0889)	.10231 (.0496)	260 (.3303)	202	215	227	85	83	87	91	209	229
M_{R1}	-.02192 (-.0151)	.05157 (.0375)	.07264 (.0343)	.28419 (.1922)	.42821 (.3451)	.20640 (.1290)	.10845 (.0768)	.02520 (.0184)	.06020 (.0300)	220 (.7517)	196	205	65	63	66	70	185	208
M_{A1}	.01844 (.0096)	.13747 (.0761)	.07263 (.0261)	.47158 (.2425)	.67156 (.4115)	.37277 (.1771)	.04703 (.0253)	.08568 (.0477)	.11979 (.0454)	.51354 (.2935)	231 (.4347)	229	70	69	71	74	197	228
M_{C1}	.03716 (.0180)	.04847 (.0249)	-.05522 (-.0184)	.15113 (.0720)	.23726 (.1347)	.65778 (.2896)	.05631 (.0281)	.11891 (.0613)	.05526 (.0194)	.16319 (.0864)	.33899 (.1365)	243 (.3731)	74	72	75	78	204	240
PE_{R1}	.04979 (.0306)	.01100 (.0072)	-.15006 (-.0633)	.35857 (.2166)	.35887 (.2584)	.29627 (.1654)	.06144 (.0389)	.16653 (.1089)	.04780 (.0213)	.13861 (.0931)	.34771 (.1776)	.21785 (.1031)	90 (.5999)	88	90	89	71	76
PE_{A1}	.20023 (.1115)	.00710 (.0042)	-.17277 (-.0661)	.16975 (.0929)	.24859 (.1622)	.26789 (.1355)	.05778 (.0331)	.06239 (.0370)	.03415 (.0138)	.16662 (.1014)	.33738 (.1561)	.10927 (.0468)	.70009 (.3806)	88 (.4927)	88	87	70	74
PE_{C1}	-.02308 (-.0138)	-.00369 (-.0023)	.09795 (.0402)	.06450 (.0379)	.10972 (.0768)	.31549 (.1713)	-.08617 (-.0530)	.17380 (.1105)	.02157 (.0093)	.12588 (.0822)	.05908 (.0293)	.29242 (.1346)	.39078 (.2280)	.32844 (.1737)	92 (.5676)	91	73	77
$ABIL_1$	-.05387 (-.0320)	-.07703 (-.0484)	-.21057 (-.0860)	.22774 (.1331)	.25706 (.1790)	.30613 (.1653)	-.03525 (-.0216)	.13918 (.0880)	.15420 (.0664)	.17263 (.1121)	.33587 (.1659)	.24244 (.1110)	.47157 (.2737)	.36718 (.1931)	.26633 (.1503)	96 (.5615)	75	80
$PEER_1$	.18357 (.0441)	.06663 (.0170)	.05362 (.0089)	.26553 (.0628)	.40558 (.1143)	.18797 (.0411)	.12620 (.0312)	-.04425 (-.0113)	.22844 (.0398)	.27207 (.0715)	.35692 (.0713)	.02449 (.0045)	.24334 (.0571)	.32735 (.0696)	.17424 (.0398)	.15554 (.0353)	238 (.0919)	222
ABS_1	-.01904 (-.2308)	.02693 (.3454)	.15414 (1.2831)	.03698 (.4407)	.02432 (.3454)	-.11854 (-1.3056)	.02397 (.2991)	-.00465 (-.0599)	.09353 (.8213)	.16814 (2.2274)	.01202 (.1211)	-.04736 (-.4420)	.05876 (.6954)	.12269 (1.3158)	.23079 (2.6567)	-.10639 (-1.2180)	.05686 (.2633)	265 (233.4601)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.15

Correlations and Covariances for Cycle 3,
Black Lower-Class School, Not Reported
Because Matrix Was Singular.

Table 6A.16

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 4, Black Lower-Class School (Corresponding to Model in Figures 5.9 and 6.4B)

	E_{A4}	E_{C4}	M_{R4}	M_{A4}	M_{C4}	E_{R3}	E_{A3}	E_{C3}	M_{R3}	M_{A3}	M_{C3}	PE_{R3}	PE_{A3}	PE_{C3}	$ABIL_3$	$PEER_4$	ABS_4
E_{A4}	126 (.7343)	126	90	116	115	119	119	119	71	119	120	65	65	65	69	125	125
E_{C4}	.22627 (.1058)	126 (.2977)	90	116	115	119	119	119	71	119	120	65	65	65	69	125	125
M_{R4}	.07356 (.0544)	.14553 (.0685)	129 (.7443)	129	128	116	116	116	75	123	123	54	54	53	55	112	129
M_{A4}	.17662 (.1126)	.20497 (.0832)	.77356 (.4977)	178 (.5535)	176	159	159	159	102	168	169	70	70	70	73	149	178
M_{C4}	.09031 (.0488)	.33263 (.1144)	.35069 (.1907)	.31923 (.1497)	177 (.3972)	158	158	158	100	167	168	71	71	71	74	148	177
E_{R3}	.04640 (.0300)	.10203 (.0420)	.00879 (.0057)	.02120 (.0119)	-.06209 (-.0295)	183 (.5694)	183	183	99	162	163	74	74	74	77	147	170
E_{A3}	.04081 (.0297)	.10751 (.0499)	.01885 (.0138)	.18823 (.1191)	.06516 (.0349)	-.14056 (-.0902)	183 (.7227)	183	99	162	163	74	74	74	77	147	170
E_{C3}	.13137 (.0580)	.30109 (.0847)	-.13879 (-.0617)	.01059 (.0041)	.15302 (.0497)	.07388 (.0287)	.30237 (.1325)	183 (.2656)	99	162	163	74	74	74	77	147	170
M_{R3}	.03792 (.0279)	.23058 (.1082)	.55343 (.4105)	.58824 (.3762)	.31634 (.1714)	.09680 (.0628)	.15556 (.1137)	.09408 (.0417)	105 (.7391)	104	104	40	40	40	44	91	105
M_{A3}	.07255 (.0367)	.10073 (.0325)	.50746 (.2586)	.71082 (.3124)	.19019 (.0708)	.02372 (.0106)	.13762 (.0691)	.00311 (.0009)	.43728 (.2221)	173 (.3489)	173	71	71	71	74	148	173
M_{C3}	.24178 (.1187)	.31965 (.0999)	.32144 (.1589)	.23431 (.0999)	.63964 (.2310)	.10204 (.0441)	.00515 (.0025)	.18449 (.0545)	.22375 (.1102)	.20570 (.0696)	174 (.3283)	72	72	72	75	149	174
PE_{R3}	..07541 (.0505)	.08013 (.0341)	.38328 (.2583)	.38748 (.2252)	.25958 (.1278)	-.03008 (-.0177)	.09049 (.0601)	.05555 (.0224)	.45207 (.3036)	.37199 (.1716)	.34592 (.1548)	79 (.6101)	79	78	77	70	74
PE_{A3}	.23295 (.1424)	.02423 (.0094)	.15328 (.0944)	.28515 (.1514)	.15205 (.0684)	.18202 (.0980)	.03323 (.0202)	.09308 (.0342)	.35518 (.2179)	.33114 (.1396)	.31432 (.1285)	.69724 (.3886)	79 (.5092)	78	77	70	74
PE_{C3}	.16182 (.0909)	.13120 (.0469)	.10945 (.0619)	.18141 (.0885)	.14240 (.0589)	.02139 (.0106)	-.11049 (-.0616)	-.01182 (-.0040)	.00557 (.0031)	.11397 (.0442)	.24409 (.0917)	.30308 (.1553)	.31914 (.1494)	79 (.4301)	77	70	74
$ABIL_3$	.06865 (.0380)	.05664 (.0200)	.56871 (.3169)	.45273 (.2176)	.23001 (.0936)	-.01069 (-.0052)	.07438 (.0408)	.03600 (.0120)	.38040 (.2113)	.40061 (.1529)	.33661 (.1246)	.55389 (.2795)	.48463 (.2234)	.17426 (.0738)	82 (.4173)	74	77
$PEER_4$	.02589 (.0067	,15181 (.0248)	.40449 (.1047)	.24374 (.0544)	.13979 (.0264)	.12711 (.0268)	.15652 (.0399)	.05603 (.0087)	-.08087 (-.0208)	.27808 (.0493)	.16129 (.0277)	-.04315 (-.0101	-.01195 (-.0026)	-.12914 (-.0254)	.08714 (.0169)	160 (.0899)	159
ABS_4	.06951 (.8838)	.02790 (.2259)	.17581 (2.2518)	.16096 (1.7771)	.05474 (.5120)	.11930 (1.3360)	.08322 (1.0498)	.11227 (.8586)	.29233 (3.7295)	.05953 (.5218)	.10977 (.9334)	.17124 (1.9849)	.11562 (1.2244)	.05920 (.5761)	.06371 (.6108)	.04878 (.6405)	125 (220.2167)

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[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.17

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 5, Black Lower-Class School (Corresponding to Model in Figures 5.10 and 6.58)

	$ABIL_5$	PE_{R5}	PE_{A5}	PE_{C5}	E_{R5}	E_{A5}	E_{C5}	M_{R5}	M_{A5}	M_{C5}	E_{R4}	E_{A4}	E_{C4}	M_{R4}	M_{A4}	M_{C4}	SEX	IQ	$ABIL_3$	PE_{R3}	PE_{A3}	PE_{C3}
$ABIL_5$	117 (.6406)	112	111	112	111	111	111	73	108	109	73	73	73	66	89	87	117	94	50	49	49	48
PE_{R5}	.59040 (.3894)	114 (.7813)	113	114	108	108	108	71	104	105	73	73	73	65	89	87	114	93	50	49	49	48
PE_{A5}	.41635 (.2484)	.53099 (.3498)	113 (.5556)	113	107	107	107	70	103	104	72	72	72	65	88	86	113	92	50	49	49	48
PE_{C5}	.31322 ([illegible])	.42189 (.2354)	.31059 (.1461)	114 (.3984)	108	108	108	71	104	105	73	73	73	65	89	87	124	93	50	49	49	48
E_{R5}	.11076 (.0651)	.23115 (.1499)	.08848 (.0484)	.22250 (.1031)	158 (.5385)	158	158	94	149	150	89	89	89	94	124	122	158	128	56	54	54	54
E_{A5}	.03613 (.0236)	.06025 (.0435)	.11880 (.0723)	.07142 (.0368)	-.04092 (-.0245)	158 (.6663)	158	94	149	150	89	89	89	94	124	122	158	128	56	54	54	54
E_{C5}	.06360 (.0272)	.12327 (.0582)	-.06145 (-.0245)	.17389 (.0587)	.24798 (.0973)	.13266 (.0579)	158 (.2858)	94	149	150	89	89	89	94	124	122	158	128	56	54	54	54
M_{R5}	.35679 (.1982)	.36436 (.1963)	.27769 (.1261)	.10564 (.0406)	.27963 (.1250)	-.12659 (-.0630)	.10552 (.0344)	105 (.3714)	105	105	57	57	57	59	76	76	105	84	39	36	36	35
M_{A5}	.10885 (.1878)	.42554 (.2474)	.28609 (.1403)	.23171 (.0962)	.08428 (.0407)	.10451 (.0561)	.06276 (.0221)	.47511 (.1904)	165 (.4326)	165	89	89	89	95	122	120	165	133	54	51	51	51
M_{C5}	.24515 (.0590)	.07840 (.0469)	.13049 (.0658)	.11359 (.0485)	-.06058 (-.0301)	-.07249 (-.0401)	.13720 (.0497)	.28900 (.1192)	.07378 (.0329)	166 (.4583)	89	89	89	95	123	121	166	133	54	51	51	51
E_{R4}	.07158 (.0426)	.05548 (.0365)	-.08635 (-.0479)	.01253 (.0059)	.31817 (.1737)	.06747 (.0410)	.06896 (.0274)	.07328 (.0332)	.04397 (.0215)	.09438 (.0475)	126 (.5537)	126	126	90	116	115	126	111	69	65	65	65
E_{A4}	.09510 (.0[illegible]2)	.09089 (.0688)	.20407 (.1303)	.01768 (.0096)	.04206 (.0264)	.21949 (.1535)	.14798 (.0678)	-.04836 (-.0253)	.07200 (.0406)	-.05683 (-.0330)	-.07807 (-.0498)	126 (.7343)	126	90	116	115	126	111	69	65	65	65
E_{C4}	.17486 (.0764)	.19414 (.0936)	.27299 (.1110)	.15690 (.0540)	.28143 (.1127)	.20175 (.0899)	.21997 (.0642)	.28725 (.0955)	.03412 (.0122)	.07507 (.0277)	.01564 (.0063)	.22627 (.1058)	126 (.2977)	90	116	115	126	111	69	65	65	65
M_{R4}	.21675 (.1240)	.30307 (.2311)	.35056 (.2254)	.22758 (.1239)	.24171 (.1530)	.00878 (.0062)	.07946 (.0366)	.45280 (.2380)	.59807 (.3393)	.29453 (.1720)	-.04790 (-.0307)	.07356 (.0544)	.14553 (.0685)	129 (.7443)	129	128	129	115	55	54	54	53
M_{A4}	.38836 (.1291)	.41787 (.2748)	.48577 (.2694)	.25375 (.1192)	.15711 (.0858)	.12930 (.0785)	-.01121 (-.0043)	.37239 (.1688)	.47657 (.2332)	.20285 (.1022)	.03634 (.0201)	.17662 (.1126)	.20497 (.0832)	.77536 (.4977)	178 (.5535)	176	178	151	73	70	70	70
M_{C4}	.40626 (.1959)	.35432 (.1974)	.37325 (.1753)	.31553 (.1255)	.31575 (.1460)	.01634 (.0084)	.11573 (.0390)	.30260 (.1162)	.18466 (.0765)	.10238 (.0437)	.00790 (.0037)	.09031 (.0488)	.33263 (.1144)	.39069 (.1907)	.31923 (.1497)	177 (.3972)	177	150	74	71	71	71
SEX	-.19965 (-.0637)	-.20575 (-.0907)	-.00424 (-.0016)	-.10343 (-.0326)	-.14059 (.0514)	-.00515 (-.0021)	-.11954 (-.0319)	.04331 (.0132)	-.03113 (-.0102)	-.16875 (-.0570)	-.11973 (-.0444)	-.02911 (-.0124)	-.16002 (-.0435)	-.15231 (-.0655)	-.19648 (-.0729)	-.24449 (-.0768)	(.2486)	187	82	79	79	79
IQ	.16845 (1.9424)	.27858 (3.5473)	.18141 (1.9480)	.33441 (3.0408)	.07346 (.7765)	.08904 (1.0471)	.06974 (.5371	.34626 (3.0399)	.42197 (3.9981)	.01378 (.1344)	-.14751 (-1.9812)	.06200 (.7653)	.09556 (.7511)	.52717 (6.5517)	.39894 (4.2759)	.22409 (2.0345)	.03740 (.2687)	187 807.5357)	66	65	65	65
$ABIL_3$	.56575 (.2925)	.41595 (.2375)	.35553 (.1712)	.29554 (.1205)	.35750 (.1695)	-.09116 (-.0481)	.06514 (.0225)	.42890 (.1688)	.44025 (.1870)	.27532 (.1204)	.09520 (.0458)	.06865 (.0380)	.05664 (.0200)	.56871 (.3169)	.45273 (.2176)	.23001 (.0936)	-.31551 (-.1016)	-.30740 (-2.8608)	82 (.4173)	77	77	77
PE_{R3}	.31379 (.1962)	.50088 (.3458)	.40985 (.2386)	.21864 (.1078)	.13324 (.0764)	.18846 (.1202)	-.01718 (-.0072)	.36105 (.1719)	.30087 (.1546)	.06784 (.0399)	-.06493 (-.0377)	.07541 (.0505)	.08013 (.0341)	.38328 (.2583)	.38748 (.2252)	.29958 (.1278)	-.29713 (-.1157)	-.18803 (-2.1158)	.55389 (.2795)	79 (.6101)	79	78
PE_{A3}	.28447 (.1625)	.40135 (.2532)	.47683 (.2536)	.16947 (.0763)	.01657 (.0087)	.19597 (.1142)	-.11432 (-.0436)	.44185 (.1921)	.27139 (.1274)	.11355 (.0549)	-.14045 (-.0746)	.23295 (.1424)	.02423 (.0094)	.15328 (.0944)	.28515 (.1514)	.15205 (.0684)	-.31752 (-.1130)	-.17394 (-1.7882)	.48463 (.2234)	.69724 (.3886)	79 (.5092)	78
PE_{C3}	.20702 (.1087)	.17762 (.1030)	.06344 (.0310)	.05573 (.0231)	.01748 (.0084)	-.08945 (-.0479)	.12714 (.0446)	.27215 (.1088)	.05445 (.0235)	.04240 (.0188)	-.08715 (-.0425)	.16182 (.0909)	.13120 (.0469)	.10945 (.0619)	.18141 (.0885)	.14240 (.0589)	-.05962 (-.0182)	-.00495 (-.0468)	.17426 (.0738)	.30308 (.1553)	.31914 (.1494)	79 (.4301)

[a] Covariances in parentheses.

[b] Variances on diagonal.

Table 6A.18

Correlations, Covariances[a], Variances[b], and Number of Pairwise Present Observations for Cycle 6, Black Lower-Class School (Corresponding to Model in Figures 5.11 and 6.6a)

	E_{R6}	E_{A6}	E_{C6}	M_{R6}	M_{A6}	M_{C6}	E_{R5}	E_{A5}	E_{C5}	M_{R5}	M_{A5}	M_{C5}	PE_{R5}	PE_{A5}	PE_{C5}	$ABIL_5$	$PEER_6$	ABS_6
E_{R6}	130 (.5177)	130	130	121	125	126	121	121	121	81	123	124	104	103	104	108	127	127
E_{A6}	.00029 (.0002)	130 (.7315)	130	121	125	126	121	121	121	81	123	124	104	103	104	108	127	127
E_{C6}	.26117 (.1045)	.09981 (.0475)	130 (.3091)	121	125	126	121	121	121	81	123	124	104	103	104	108	127	127
M_{R6}	.24205 (.1360)	.16902 (.1129)	.14326 (.0622)	166 (.6098)	164	165	143	143	143	103	158	158	99	98	99	103	141	163
M_{A6}	.18251 (.1083)	.35851 (.2529)	.19918 (.0913	.64269 (.4139)	171 (.6803)	170	148	148	148	103	163	163	103	102	103	107	145	168
M_{C6}	-.03084 (-.0158)	.04739 (.0289)	.13596 (.0539)	-.08028 (-.0447)	.06968 (.0410)	172 (.5089)	148	148	148	105	164	164	104	103	104	108	145	169
E_{R5}	.22988 (.1214	.01547 (.0097)	.23376 (.0954)	.24856 (.1424)	.15262 (.0924)	-.02067 (-.0108)	158 (.5385)	158	158	94	149	150	108	107	108	111	140	149
E_{A5}	.05352 (.0314)	.28871 (.2016)	.01634 (.0074)	.04609 (.0294)	.21692 (.1460)	.08429 (.0491)	-.04092 (-.0245)	158 (.6663)	158	94	149	150	108	107	108	111	140	149
E_{C5}	.31213 (.1201)	-.02419 (-.0111)	.34261 (.1018)	.12889 (.0538)	.06532 (.0288)	.18280 (.0697)	.24798 (.0973)	.13266 (.0579)	158 (.2858)	94	149	150	108	107	108	111	140	149
M_{R5}	.17018 (.0746)	.18142 (.0946)	.20246 (.0686)	.69714 (.3318)	.42690 (.2146)	.06107 (.0265)	.27963 (.1250)	-.12659 -.0630)	.10552 (.0344)	105 (.3714)	105	105	71	70	71	73	90	104
M_{A5}	.26530 (.1255)	.21980 (.1236)	.14505 (.0530)	.59462 (.3054)	.73346 (.3979)	-.01215 (-.0057)	.08428 (.0407)	.10451 (.0561)	.06276 (.0221)	.47511 (.1904)	165 (.4326)	165	104	103	104	108	142	162
M_{C5}	.02537 (.0124)	.06259 (.0362)	.13016 (.0490)	.00624 (.0033)	.03838 (.0214)	.70492 (.3405)	-.06058 (-.0301)	-.07249 (-.0401)	.13720 (.0497)	.28900 (.1192)	.07378 (.0329)	166 (.4583)	105	104	105	109	143	163
PE_{R5}	.29052 (.1848)	.12220 (.0924)	.28296 (.1391)	.39732 (.2742)	.46513 (.3391)	.10984 (.0693)	.23115 (.1499)	.06025 (.0435)	.12327 (.0582)	.36436 (.1963)	.42554 (.2474)	.07840 (.0469)	114 (.7813)	113	114	112	104	104
PE_{A5}	.11945 (.0641)	.23962 (.1528)	.09079 (.0376)	.26727 (.1556)	.35926 (.2209)	.16445 (.0875)	.08848 (.0484)	.11880 (.0723)	-.06145 (-.0245)	.27769 (.1261)	.28609 (.1403)	.13049 (.0658)	.53099 (.3498)	113 (.5556)	113	111	103	103
PE_{C5}	.10723 (.0487)	.03723 (.0201)	.22167 (.0778)	.19059 (.0939)	.31809 (.1656)	.18555 (.0836)	.22250 (.1031)	.07142 (.0368)	.17389 (.0587)	.10564 (.0406)	.23171 (.0962)	.11359 (.0485)	.42189 (.2354)	.31059 (.1461)	114 (.3984)	112	104	104
$ABIL_5$	.22968 (.1323)	.01751 (.0120)	.27945 (.1244)	.24515 (.1532)	.40779 (.2692)	.11440 (.0653)	.11076 (.0651)	.03613 (.0236)	.06360 (.0272)	.40626 (.1982)	.35679 (.1878)	.10885 (.0590)	.55040 (.3894)	.41635 (.2484)	.31322 (.1582)	117 (.6406)	108	108
$PEER_6$	-.00806 (-.0018)	.15187 (.0400)	.04753 (.0081)	.25227 (.0606)	.35422 (.0899)	.09834 (.0216)	.03440 (.0078)	.15334 (.0385)	.09610 (.0158)	.17749 (.0333)	.32594 (.0660)	.10045 (.0209)	.30331 (.0825)	.30474 (.0699)	.18759 (.0364)	.13378 (.0329)	150 (.0947)	148
ABS_6	.13974 (1.3910)	.25198 (2.9818)	.00470 (.0361)	.22019 (2.3789)	.21632 (2.4684)	-.14986 (-1.4791)	.04579 (.4649)	.13472 (1.5214)	-.01249 (-.0924)	.11166 (.9414)	.22843 (2.0786)	-.20491 (-1.9193)	.22112 (2.7041)	.35338 (3.6444)	.12723 (1.1111)	.12806 (1.4181)	.10211 (.4347)	175 (191.4155)

[a] Covariances in parentheses.

[b] Variances on diagonal.

CHAPTER 7

OUTCOMES OF SCHOOLING

To this point all of the models have focused on the process of schooling with the aim of understanding two cognitive outcomes (teachers' marks in reading and arithmetic) and four affective outcomes (teachers' marks in conduct and children's expectations in reading, arithmetic, and conduct.) In this chapter we will comment on the larger significance of those outcomes.

Affective Outcomes

There is no "outside" criterion against which to assess the validity of the affective outcomes, no standardized tests of "conduct" nor benchmarks for children's expectations. As we have seen,conduct has considerable bearing on marks in reading and arithmetic so some of its importance is reflected in the calibre of the child's academic performance. As far as children's expectations are concerned, there is probably no such thing as an ideal level.

Drawing upon some earlier ideas (Entwisle and Hayduk, 1978: 170ff) we call to the reader's attention the close conceptual relation between early self-expectations and a child's sense of control. No one seems to have looked at how a child develops feelings of control or a sense of efficacy despite the frequent use of an "efficacy" variable in sociological studies (see e.g. Coleman, 1966). Just as self-esteem or expectations have been studied only in older children, so also a person's sense of control has not been traced to its sociopsychological roots.

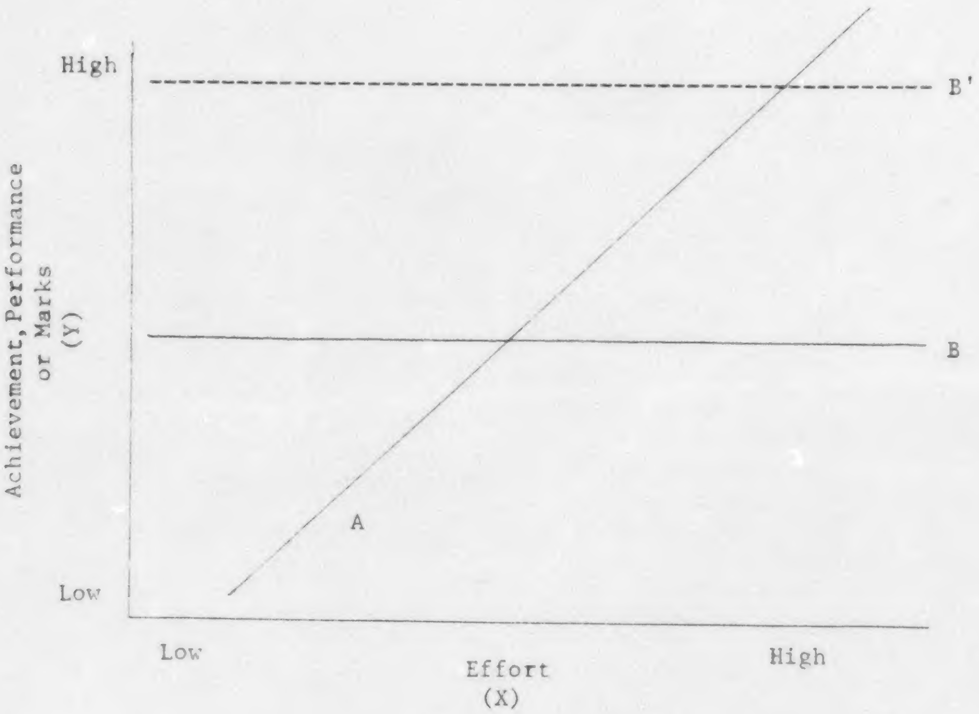
The basic notions of internal and external control can be represented as the slope of A and B respectively in figure 7.1. Line A represents the model assumed by persons who view performance or achievement as being contingent upon the effort expended. The person who works hard can expect to do well; persons who work little can expect to do poorly. Such persons view events as being at least partly responsive to their internal control. Line B represents the model assumed by persons who view performance as being independent of effort. They feel that no matter what they do their achievement or performance is unaffected. External forces control what will befall them. The two models represent the degree to which people perceive events as being contingent upon their own actions.

The role of expectations in these models is clear: given a model such as A (that for an internal control individual), expectations are the individual's predictions for level of achievement in relation to effort. In this sense expectations are the predicted level of achievement the person holds as a standard until comparison of this expected achievement with his actual achievement is possible. In our research children held their expectations from some time of formation until the time the report cards were issued, at which time they were able to compare their actual and expected performance.

Expectations play a relatively minor role in the day-to-day operation of the cognitive structures for models A and B shown in figure 7.1. Expectations play a much more prominent role, however, in both the original development of those structures and in their modification once they are developed. To illustrate the role expectations might play in the development of cognitive control structures, we will speculate a little on how sense of control develops.

Figure 7.1

Geometric Representation of Internal and External Control



Children's beginning attempts to discover a control function appropriate for themselves might consist of a set of trials in which, after noticing the effort they are expending, they guess at an appropriate control function from which to derive expectations (a random guess at first). The child, for example, exerts high effort (an x value) and then tries to guess the likely achievement (a y value). Next the child monitors actual performance. Finally, he uses the discrepance between the expected y value and the actual ŷ value (performance) to improve the "guessing" rule. It is the attention given to the discrepance between the expected and the actual performance that allows alteration of the prediction rule so the next prediction of y from x is better. This sequence of events could be repeated many times. Each time the child would note effort level, formulate an expectation, and then observe the actual level of achievement that occurred. Eventually the child should develop a reasonably specific control function, for example line A in figure 7.1 consisting of many observed and corrected (x, y) points.

The hypothetical series of events just outlined parallels what was observed for middle-class children. At first their expectations were almost random in the sense that the variance of initial expectations was relatively large (see Table 5.2) and furthermore determinacy was low (see Figure 6.1M). As time passed, however, and starting with the latter half of first grade, expectations always responded to previous marks within any grade and by the third year there was even some carry-over between grades.

The operation of a similar iterative approximation procedure in the lower-class schools would produce a model more like B, however, because expectations were maintained at an unrealistically high levels for reading and arithmetic. Somehow the children maintained high expectations no matter what degree of effort they felt themselves expending and no matter how discrepant their actual performance was in comparison with their previous expectations. Expectations in the integrated school, for example, never responded to prior marks. They may have misread their actual performance, or not recognized its significance, or even have been rewarded for not discovering the correspondence between level of effort and level of achievement. Whatever forces children to form consistently high expectations will also force them to develop the control function diagrammed as B' in figure 7.1. Since they do not formulate lower expectations (i.e., the discrepance is ineffective), they cannot develop control functions that require them to modify (lower) their expectations. As a result they develop an external control function that produces high performance expectations irrespective of effort--subjectively, all levels of effort are linked to the same (high) expected performance, as noted in the Coleman report.

Children in the middle-class school, by contrast, apparently developed a control function like model A rather quickly. In fact they may have started school with such a function already under construction. Changes in expectations that moved these children toward consistency with marks represent an adjustment in the slope (and/or intercept) of the control function. Similarly, a change in marks that moves marks toward expectations causes the child to adjust the slope (and/or intercept) of the control function.

If middle-class children have a reasonably accurate control function when they start school, they may derive it from two sources. Either they have generalized from control curves developed previously for other similar activities, or they have been socialized explicitly to have such curves. The middle-class ethic underlying sayings such as "You can do it if you try," "Nothing ventured, nothing gained," or "If at first you don't succeed, try, try, again" could produce socialization practices that directly lead young middle-class children to have such curves.

The foregoing discussion resolves some paradoxes, for it suggests how high expectations can be dysfunctional and how lower-class children could simultaneously have high expectations and a low sense of control. In fact, the developmental approach taken in this book and the specific findings that have emerged allow a sensible integration of previously inconsistent sets of findings concerning aspirations and control.

Control, efficacy, and expectations are important because they are related to early achievement behavior. In turn, early achievement is important because it is a stable personal attribute that predicts both later achievement behavior and eventual status attainment. Plainly, , high desire and competence are not necessarily connected--neither middle-class or working-class children in this study were successful at predicting first marks. Too high a desire, furthermore, may undercut both the child's actual success and the child's perception of his ability to improve his performance.

The association between desire and success is complex, and is probably contingent upon the social milieu of the child. The present research shows that contingencies in one school were better adapted for producing personally experienced success than were contingencies in the other schools.

The criterion for assessing expectations is thus complex. As pointed out in Chapter 2, self-expectations are both an outcome of schooling and a mediator of it. Depending on the influences to which expectations respond, they may or may not serve as mediators. As outcomes, they do not look much different in level or in determinacy from one school to another. Up to the end of third grade all of the children in this study held comparable academic expectations (1.74 to 1.89 in the middle-class school, 1.74 to 1.85 in the lower-class integrated school, 1.57 to 1.93 in the lower-class black school). But as we have repeatedly noted, expectations are on target in one place and off target in the other two places. Schooling is succeeding in all three places to the extent that children develop positive views of their own capabilities or likely success. But to have expectations consistently above the level of performance implies that the feedback system is disrupted, that expectations are not serving as mediators in the two lower-class schools. They do persist continuously in those two schools and at various times respond to sex, IQ, absences, parent, and peer variables--in other words to every other prior variable in the system except race.

Teachers' Expectations

In Chapter 2 we reviewed the cascade of studies on teachers' expectations and pointed out that until the link between expectations and rewards was made clearer, it would be very difficult to weave teachers' expectations into models of schooling. At this point we are inclined to think that teachers' expectations and teachers' marks are in practice indistinguishable and for this reason are not useful as separate entities in schooling models. A teacher's momentary behavior may vary--dyadic studies indicate that the teacher may variously reward, punish, press, or ignore students in line with expectations. But over a semester a teacher probably shapes her expectations to match a child's level of performance. In other words, after some classroom interaction, teachers' expectations and marks are very highly correlated. This is not to say that either is a true barometer of the child's performance capabilities. On the other hand, as we will make clear later in this chapter, teachers' marks do predict quality of children's performance as judged by standardized tests.

We refrained from asking teachers at the beginning of the year about expectations they held for children in their classes because we were afraid that by asking such a question the usual schooling process would be distorted. Most of the teachers whose pupils we studied were well aware of Pygmalion-in-the-classroom research and its implications. However, at the end of the year questions could be asked about forecasts for the coming year that would tap expectations. Accordingly we wrote to teachers after school closed for the summer and offered them a modest payment for forecasting the marks they expected children to receive in the following year in reading and arithmetic. In other words we employed the same "projective" strategy with teachers that we employed with parents and children--by asking for forecasts of specific marks we operationalized what we mean by the expectation construct. We then correlated these forecasts with both the marks the teacher actually gave at two points in the preceding year and the marks given by the teacher in the next grade (See Table 7.1).

In all schools in both reading and arithmetic correlations with the teacher's own year-end marks are high--above .60 in every instance, and

Table 7.1

Correlation of Teacher Expectations with Children's Marks, All Schools[a]

	White Middle-Class School				Integrated Lower-Class School				Black Lower-Class School			
	Child's Kind. Marks		Child's 1st Gr. Marks		Child's Kind. Marks		Child's 1st Gr. Marks		Child's Kind. Marks		Child's 1st Gr. Marks	
	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End
Kindergarten Teacher's Forecast -- Reading	--	--	.17* (174)	.39*** (174)	--	--	.41*** (144)	.42*** (137)	--	--	.25** (97)	.55*** (103)
-- Arithmetic	--	--	.17 (85)	.18 (85)	--	--	.38*** (114)	.51*** (111)	--	--	.60*** (108)	.68*** (109)
	Child's 1st Gr. Marks		Child's 2nd Gr. Marks		Child's 1st Gr. Marks		Child's 2nd Gr. Marks		Child's 1st Gr. Marks		Child's 2nd Gr. Marks	
	Mid-year	Year End	Mid-Year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End
First Grade Teacher's Forecast -- Reading	.42*** (297)	.61*** (302)	.45*** (208)	.41*** (208)	.60*** (304)	.69*** (332)	.61*** (156)	.48*** (188)	.54*** (153)	.63*** (172)	.43*** (48)	.67*** (61)
-- Arithmetic	.47*** (241)	.69*** (244)	.34*** (156)	.31*** (156)	.66*** (318)	.70*** (330)	.60*** (187)	.62*** (188)	.71*** (168)	.74*** (178)	.59*** (84)	.62*** (82)
	Child's 2nd Gr. Marks		Child's 3rd Gr. Marks		Child's 2nd Gr. Marks		Child's 3rd Gr. Marks		Child's 2nd Gr. Marks		Child's 3rd Gr. Marks	
	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End	Mid-year	Year End
Second Grade Teacher's Forecast -- Reading	.54*** (318)	.60*** (320)	.51*** (206)	.52*** (207)	.74*** (215)	.74*** (247)	.73*** (105)	.71*** (149)	.62*** (65)	.80*** (72)	.53*** (45)	.68*** (72)
-- Arithmetic	.59*** (322)	.72*** (323)	.41*** (213)	.34*** (213)	.61*** (244)	.71*** (251)	.50*** (145)	.54*** (144)	.65*** (95)	.84*** (99)	.34*** (73)	.58*** (72)

[a] N's appear in parentheses.

* one-tailed, p < .05.

** one-tailed, p < .01.

*** one-tailed, p < .001.

averaging .64 in the middle-class school, .71 in the lower-class integrated school, and .75 in the lower-class black school. Furthermore the patterns of correlations between "forecasts" and marks given by the teacher in the middle of the year are as would be expected--correlations are somewhat lower in all schools, with the largest discrepancy for the first half of the year in the middle-class school. The forecasts turned out to be accurate also in the sense that they did predict marks in the next grade as well, with prediction consistently better in the two lower-class schools than in the middle-class school.

From our point of view and in terms of the heuristic model shown in Figure 4.1, teachers' expectations are the same as marks. In the middle of any school year there is relatively less correspondence between year-end expectations and marks, but we believe that if we had asked for "forecasts" in the middle of the school year we would have found the same degree of correlation between midyear forecasts and midyear marks that we found for year-end forecasts and year-end marks. Evaluation and expectation may differ in a micro-model but probably cannot be distinguished in a mid-range model. It may be important to do research prompted by micro-models to understand the contingencies governing short-term evaluation (status, calibre of performance, previous history of evaluation and the like) but at this time in our opinion it is far more useful to proceed along other lines. Murnane (1975) and others have evaluated rather specific models where some teacher variable or student characteristic is studied in relation to measured performance. In this sense male teachers, shown by Murnane to be more effective, may be more effective because they are more variable in their marking standards, because in evaluation they pay less attention to a child's sex, or for some other reason. But this sort of information can be sorted out from a mid-range model of the kind we have proposed. To find that teachers hold students for whom they hold high expectations to higher standards conveys understanding of a micro-process but does not readily transfer to schooling issues. What predicts teachers' expectation levels? To what extent are "standards" operationally distinct from expectations or evaluation? How does momentary teacher-pupil interaction translate into pupil achievement? The models involving teachers' expectations put forward by Finn (1972) and Braun (1976) have intuitive appeal but the concepts employed are largely beyond the reach of realistic research at this time, and maybe indefinitely. In our opinion, midrange models involving evaluation as a behavioral expression of expectations offer more promise at present.

Standardized Achievement

A major concern of this research is the interplay between expectations (both children's and parents') and each child's unique marking history. While this emphasis captures the daily routine of schooling as viewed by the participating individuals, it has forced aside another basic issue--namely what this daily context implies about children's eventual ability to read and do arithmetic as judged by completely objective standards.

The failings of marks as indicators of actual performance capabilities are obvious. As we have seen, marks have different distributions from one school to another and can bear different relations to IQ and other kinds of standardized tests. In the black and integrated inner city schools, report card marks were supposed to reflect children's performance capabilities. In the white suburban school, children were ostensibly marked in terms of effort. In fact, these two seemingly polar marking policies led to outcomes that were remarkably similar across schools, however, for the correlations between marks and standardized achievement (Table 5.11) indicated that, while there might be some differences in the basis of mark assignments among schools in the first grade, there is no real difference in the later grades.

In practice teachers can ignore neither the absolute quality of performance nor effort. There is no way a teacher in the middle-class white school can give a B or C to the best reader in the class even if that child seemingly performs without effort. By the same token, there is no way teachers in the two lower-class schools can keep pupils motivated if those who try hard are not rewarded. If the teacher assigns marks only on the basis of performance, rewarding equally those who are trying and not trying, students who are expending extra effort will soon cease. Classroom contingencies require that a composite standard be applied, so despite different policies in various schools the outcomes are eventually similar.

Two standardized achievement tests provide a foundation for an intensive investigation of the relations between marks, expectations and objective performance capabilities. The two tests, the Iowa Test of Basic Skills (ITBS) and the California Achievement Test (CAT), were the only achievement tests administered in more than one school in third grade. The criterion of "more than one school" will allow inter-school comparisons, while that of "third grade testing" means the patterns observed will reflect the outcome of the schooling process for the entire series of cyclic models for each school.

The ITBS was administered to three cohorts of children from the white suburban school, two cohorts from the integrated school, and one cohort from the black school. Each cohort comprised three to four classes. The CAT was administered to a single cohort in the integrated and black schools. Both tests were routinely administered as part of school-district-wide testing programs. Information is available on fewer cohorts from the lower-class schools because these schools were included in our research later than the middle-class school. Hence the reduced case base here is not a consequence of selective attrition.

Scores for both tests are recorded as grade equivalents. A child with a score of 2.5 thus performs at a level typical of students half-way through second grade. A superior student receiving a score of 4.0 is therefore not doing fourth grade work, but rather did as well on the test as a typical student beginning fourth grade.

Table 7.2 presents the means and standard deviations for these tests by cohorts. This table duplicates findings already seen in Table 5.6 . First, there is almost no difference between the mean levels of reading and arithmetic performance within schools. Children tend to perform equally well or poorly in both subject areas. Second, the middle-class children outperform the lower-class children whether the lower-class children attend the all black or the integrated school. The lower-class children are about one year below the standards specified by the tests, and the middle-class children are about one year above the test norms. Outcomes for the two different tests agree remarkably well in both lower-class schools, especially when one considers that the ITBS was given five to six months later than the CAT. Another fact worth noting is that cohort differences within schools are very small. This provides direct support for our contention that the reduced case base caused by absence of some entire cohorts should not be considered a serious threat to the analysis.

Examination of the mark-achievement test correlations in Chapter 5 indicated that third grade marks in reading and arithmetic in both the middle-class and integrated schools correlate about .5 with Iowa (ITBS) scores. The ITBS-mark correlation is higher (about .6) for the black school. The California (CAT) scores correlate about .7 with third grade marks in the integrated school and in the black school they tended to be slightly above .6 for reading and slightly below .6 for arithmetic. These correlations are sufficiently large to demonstrate that a very

Table 7.2

Means and Standard Deviations for Third Grade Iowa Test of Basic Skills and California Achievement Test Scores by Cohort[a]

	Reading			Arithmetic		
	Mean	S.D.	N	Mean	S.D.	N
IOWA TEST OF BASIC SKILLS						
White Middle-Class School						
Cohort 1	4.6	1.07	98	4.3	.86	98
Cohort 2	4.9	1.03	106	4.7	.63	103
Cohort 3	4.6	1.08	72	4.6	.77	72
Integrated Lower-Class School						
Cohort 1	2.7	.82	96	3.0	.70	94
Cohort 2	2.8	.73	72	3.0	.76	74
Black Lower-Class School						
Cohort 1	2.8	.81	73	2.8	.60	71
CALIFORNIA ACHIEVEMENT TEST						
Integrated Lower-Class School						
Cohort 1	2.0	.93	98	2.0	.79	94
Black Lower-Class School						
Cohort 1	2.0	1.13	88	2.0	.71	87

[a] Scores are grade equivalents. Testing was carried out in April-May (ITBS) or November (CAT) of the third grade year.

substantial component of teachers marks in all schools are associated with objectively measured performance.

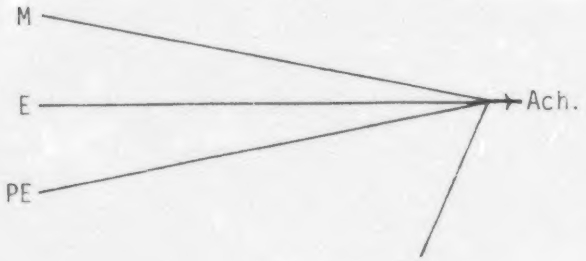
The relationship between marks and standardized achievement can be studied further by examining the unique contribution of teachers' marks and of children's and parents' expectations to standardized achievement measures with a multiple regression model. Besides allowing us to see if marks are significant predictors of achievement when expectations are controlled, this strategy permits assessment of the contribution of expectations to children's actual achievement, controlling for other variables in the equation. That is, the impact of expectations not routed through marks may be assessed. It is possible that expectations govern learning behavior outside school or in other ways foster learning not weighed by the teacher, and so contribute directly to performance.

Multiple regression equations were estimated by use of LISREL. No χ^2 tests to assess fit are possible here, however, because all the available degrees of freedom were used in estimating parameters. The two basic equations estimated are shown in Figure 7.2.

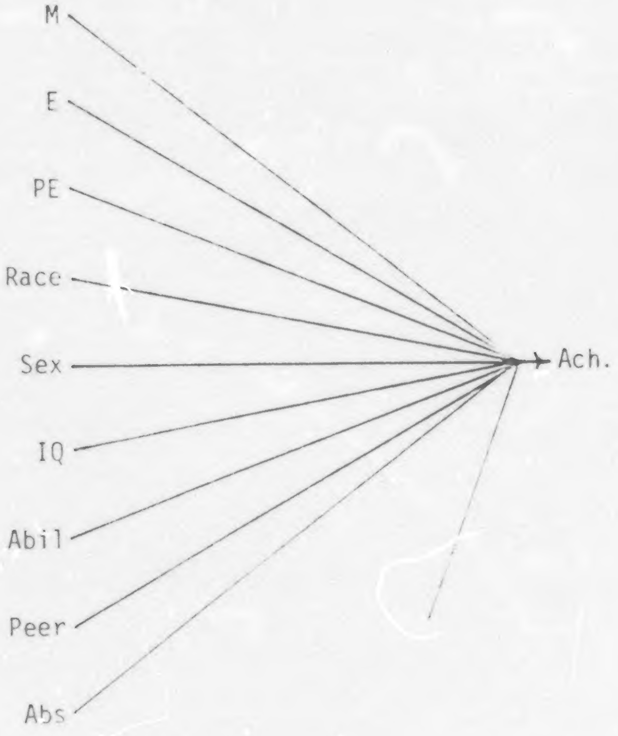
The equation corresponding to the upper portion of Figure 7.2 assessed the contributions to children's performance capabilities of children's marks and of both parents' and children's expectations. Equations were estimated separately for reading and arithmetic achievement in each of the schools and for each of the achievement tests. The marks and expectations used as predictor variables in obtaining these estimates were the last set of marks or expectations obtained before the tests were given. Typically these were marks and parents' expectations at mid-year of grade three and children's expectations at either the middle

Figure 7.2 Models for Standardized Achievement.[1]

Contributions of Marks and Expectations to Standardized Achievement.



Contributions to Achievement with Additional Control (Predictor) Variables



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[1] The dependent variable is either reading or arithmetic performance on the ITBS or CAT while the predictor variables are marks and expectations in the same subject area.

or end of third grade, depending on the actual timing of achievement testing. The ITBS was always administered in April or May of the year while CAT was administered in November.

The equation corresponding to the lower portion of Figure 7.2 includes an additional set of predictors and hence controls for these further variables. Again, the justifiable controls depend somewhat on the actual timing of the testing, so $PEER_6$ and ABS_6 do not appear in equations for CAT scores.

Parameter estimates for these two styles of models are presented in Table 7.3. Children's marks contribute significantly to both reading and arithmetic achievement in all schools when only expectations are controlled. The superlative performance of reading marks in predicting reading achievement in the black lower-class school is not out of line because for this cohort teachers at times assigned marks exactly according to the level of the reader the child was working in at report card time. The coefficient of .511 for suburban children's reading marks indicates that a child who received a mark one unit above his classmates performs in a way comparable to children half a year ahead of him in school. Similar interpretations can be provided for all the coefficients in Table 7.3.

The only instance in which children's expectations provided a direct contribution to standardized achievement was in the middle-class school for arithmetic. While 14 of the 20 parameters for the impact of children's expectations are in the predicted direction, few even approached significance, but their impact on performance as measured by the CAT was slightly negative. Even though the impact of children's arithmetic

Table 7.3

Prediction of Standardized Achievement Scores (ITBS, CAT)[1,2,3]

Dependent Variable	Independent Variables									Determinacy
ITBS - READING	M_{R5}	(E_{R6})	PE_{R5}	RACE	SEX	IQ-G3	$ABIL_5$	$PEER_6^4$	ABS_6^4	
White Middle-Class School										
3 Variables	$.511^{*}$	.018	$.988^{*}$							.547
All Variables	.198	.175	$.545^{*}$	---	$.189^{+}$	$.037^{*}$	$.164^{+}$	.056	-.002	.732
Integrated Lower-Class School										
3 Variables	$.517^{*}$	.053	-.035							.399
All Variables	$.408^{*}$	.105	-.099	.085	-.005	$.016^{+}$	.038	.145	-.001	.399
Black Lower-Class School										
3 Variables	1.278^{*}	.135	-.171							.844
All Variables†	1.278^{*}	.245	-.088	---	.265	.017	$-.541^{*}$	.594	-.001	.939
CAT - READING	M_{R5}	(E_{R5})	PE_{R5}	RACE	SEX	IQ-G3	$ABIL_5$	$PEER_6^4$	ABS_6^4	
White Middle-Class School[5]										
Integrated Lower-Class School										
3 Variables	$.830^{*}$	.031	.111							.762
All Variables	$.659^{*}$	.001	.038	.034	$.218^{+}$	$.033^{*}$	-.077	---	---	.922
Black Lower-Class School										
3 Variables†	1.672^{*}	-.127	$.264^{+}$							.941
All Variables†	1.834^{*}	-.167	$.535^{*}$	---	-.249	-.016	$-.396^{+}$	---	---	.941
ITBS - ARITHMETIC	M_{A5}	(E_{A6})	PE_{A5}	RACE	SEX	IQ-G3	$ABIL_5$	$PEER_6^4$	ABS_6^4	
White Middle-Class School										
3 Variables	$.363^{*}$	$.340^{*}$	$.425^{*}$							.458
All Variables	$.368^{*}$	$.205^{*}$	.090	---	.143	$.030^{*}$	$.113^{+}$	.007	.001	.698
Integrated Lower-Class School										
3 Variables	$.355^{*}$	.123	$.261^{*}$							.409
All Variables	$.235^{*}$	$.134^{+}$	.147	.105	$.208^{*}$	$.035^{*}$	.009	$-.612^{+}$	.000	.666
Black Lower-Class School										
3 Variables	$.616^{*}$	-.019	.126							.598
All Variables	$.491^{+}$	-.006	.033	---	$-.213^{+}$	.010	.121	.061	.001	.667
CAT - ARITHMETIC	M_{A5}	(E_{A5})	PE_{A5}	RACE	SEX	IQ-G3	$ABIL_5$	$PEER_6^4$	ABS_6^4	
White Middle-Class School[5]										
Integrated Lower-Class School										
3 Variables	$.694^{*}$	-.095	$.241^{*}$							.758
All Variables	$.527^{*}$	-.084	$.167^{+}$	-.065	-.098	$.024^{*}$	.030	---	---	.868
Black Lower-Class School										
3 Variables	$.355^{*}$	.052	$.438^{*}$							.549
All Variables	$.238^{*}$	.073	$.444^{*}$	---	$-.381^{*}$	.012	.068	---	---	.651

[1] ITBS = Iowa Test of Basic Skills (recorded in units of grade equivalents)
CAT = California Achievement Test (recorded in units of grade equivalents)

[2] * indicates parameter is at least twice its standard error.
+ indicates parameter is 1.5 to 1.99 standard errors.
† indicates the error variance was set as near 5% of the total variance as possible to eliminate small negative variances provided by LISREL without this condition. This additional constraint made no substantial changes to the other parameter estimates.

[3] $\chi^2 = 0$ for all models with free error variances (since d.f. = 0). χ^2 indicated acceptable fits for all models noted in † above.

[4] The timing of CAT testing eliminated this as a justifiable control variable.

[5] The CAT was not taken by pupils in this school.

expectations in the middle-class school held up with inclusion of additional controls, this is far from overwhelming support for any general assertion that children's expectations impact directly on their actual achievement. However, this does not necessarily mean that children's expectations are not important. Part of the impact of children's expectations was undoubtedly absorbed through indirect routes, namely through their slight impact on marks. But the impact of expectations via indirect routes is not likely to be very substantial since the impact of children's expectations on the interveining variables are inconsistent and relatively small. Nevertheless expectations remain important as an affective outcome irrespective of their impact on achievement.

Parents' expectations, in contrast, seem to have an effect on achievement as measured by at least one or the other of the standardized tests in all three schools in both reading and arithmetic. (Parental expectations for reading in the integrated school are an exception.)

Insertion of the additional controls (the lower portion of Fig. 7.2) led to only slight changes. Children's expectations remained generally ineffective, with the notable exception of middle-class children's arithmetic expectations. Marks remained generally strong as predictors although two formerly significant parameters dropped far below significance, and another parameter just missed significance. But it is impressive indeed that the majority of marks contributed substantially to achievement when both sex and IQ were controlled.

With the additional controls, the picture for parental expectations is unclear. Parental expectations in the black school still seem to contribute to one standardized test (CAT) but not the other (ITBS).

while white middle-class parents' expectations contribute in reading but not in arithmetic. Parental expectations in the integrated lower-class school show no significant effects on reading achievement but they do come close to providing significant contributions to arithmetic achievement as recorded by both tests.

In concluding our discussion of Fig. 7.2 we should note that in general these figures (equations) explained a substantial portion of the variance in achievement scores. Generally more than 50 percent of the variance was explained by the limited model while more than 70 percent of the variance was explained after insertion of additional variables. As with the models presented in Chapters 5 and 6, however, in this exploratory work our interest fastens upon the gross rather than the fine-grained structure of these findings. Again race per se has no substantial effects. But the critical finding is that teachers' evaluations (marks) are, with one exception, substantial contributors to standardized achievement with all other variables controlled.

Conclusions are two. First, measuring marks as an outcome is tantamount to measuring standardized achievement. In every school, as shown in Chapter 5, marks alone explain a large fraction of variance in achievement. Naturally first-grade marks are not as good predictors of achievement measured in third grade as teachers' marks, but the correspondence is clear. Second, study of marks and other variables in relation to standardized achievement reveals that the awarding of marks (evaluation by the teacher) is a determinant of achievement level with IQ, sex and other critical variables controlled.

Some further regression models were run to investigate the role of conduct vis à vis standardized achievement. In Chapter 5 we argued for placing conduct marks ahead of other marks on the grounds that deportment and other bases for assigning conduct marks likely contribute to reading and arithmetic marks as well, and one way to filter out non-performance factors was to use conduct as a predictor of reading and arithmetic performance. At that time, however, we noted that conduct could contribute to learning directly because, aside from "halo" factors, those children who are quiet and orderly may be able to devote themselves more efficiently to learning.

Data assembled in Table 7.4 show that, net of conduct's contribution to other marks and controlling on other variables, in 9 of 19 instances the direct contribution of the conduct mark to standardized achievement is positive. Furthermore in the black lower-class school in two instances the direct link between conduct and standardized achievement is sizeable and significant by our arbitrary standards. In many instances here, as in the earlier summary over 6 cycles by school, reading and arithmetic marks respond to conduct. But the additional response of standardized achievement to conduct, with mark controlled and with halo effects ruled out because of the objective nature of the tests, suggests that in young children conduct can directly facilitate or hinder learning. All data here are for children in third grade. In reviewing findings in Table 6.16 we saw that parameters linking conduct to other marks were large in 2 of 12 instances in third grade, in 6 of 10 instances in second grade, and in 8 of 12 instances in first grade. In short, conduct looks more critical in first than in third grade. Thus if we had measures of standardized achievement taken in first grade, we suspect that findings analogous to

Table 7.4

Prediction of Standardized Achievement in Reading and Arithmetic with Conduct Mark Included

Dependent Variables	Independent Variables						Determinacy
READING	M_{C6}	M_{R6}	SEX[a]	IQ	ABS	RACE	
White Middle-Class School							
M_{R6}	.22*						.07
ITBS - Reading	.20+	.53*	.21	.031*	.004		.32
Integrated Lower-Class School							
M_{R6}	.40*						.09
ITBS - Reading	.05	.42*	.02	.011*	-.002	.04	.26
Black Lower-Class School							
M_{R6}	-.09						.01
ITBS - Reading	.37*	.39*	-.10	.014+	-.003		.28
ARITHMETIC	M_{C6}	M_{A6}	SEX	IQ	ABS	RACE	
White Middle-Class School							
M_{A6}	.24*						.07
ITBS - Arithmetic	.07	.43*	.04	.023*	.006		.33
Integrated Lower-Class School							
M_{A6}	.45*						.08
ITBS - Arithmetic	.02	.28*	.20*	.022*	.000	-.02	.38
Black Lower-Class School							
M_{A6}	.08						.004
ITBS - Arithmetic	.02	.30*	-.16	.016*	-.002		.30
READING	M_{C5}	M_{R5}	SEX	IQ	RACE		
Integrated Lower-Class School							
M_{R5}	.52*						.11
CAT - Reading	.07	.54*	.25+	.027*	.01		.58
Black Lower-Class School							
M_{R5}	.26+						.08
CAT - Reading	-.02	1.57*	-.21	.005			.71
ARITHMETIC	M_{C5}	M_{A5}	SEX	IQ	RACE		
Integrated Lower-Class School							
M_{A5}	.44+						.10
CAT - Arithmetic	.12	.52*	-.07	.019*	-.09		.56
Black Lower-Class School							
M_{A5}	.07						.005
CAT - Arithmetic	.31*	.29*	-.44*	.020*			.34

*2 or more times standard error.

+1.50 to 1.99 times standard error.

those reported in Table 7.4 would be even more impressive. There seems little doubt that early social development, insofar as it is measured by the conduct mark, has very important effects on achievement. Berkeley's (1978) work reveals that kindergarten teachers in the middle-class school spend much of their time training students in school conduct in the belief that such preparation will enhance learning in first grade, and contrary to intuition, that kindergarten teachers in the two lower-class schools spend less time this way. Our analysis underscores the profit for children from such a kindergarten strategy.

CHAPTER 8

OVERVIEW

Sociology sees society mainly as an aggregation of adults, stratified by social class, mostly locked into formal organizations to earn a living, and, within the system, mobile or stationary depending on age, sex, race or family status. Adults' religious views and habits, their ties to voluntary organizations, their reactions to illness, their labor market participation, their voting records, and even their intimate family behaviors all attract sociologists' attention. In fact, every facet of an adult's life as he/she interacts with other persons or with institutions is of potential interest to the sociological researcher. But, for some reason, as we pointed out in Chapter 1, sociologists have virtually ignored children. Sociology does not "see" childhood. The age truncation in sociology is clearly apparent in age schematizations of society (Riley, Johnson, and Foner, 1972, Figure 10-1, p. 400). There "young" refers to high school and college-age persons; no one younger than high school age is included in Riley et al.'s table. Even work like Kohn's (1969), which is often classed as research on "child socialization", is concerned mainly with adults. It is based entirely on interviews with adults--the actions parents take toward their children, whether parents' actions reflect their work values, how work conditions of the husband affect the wife, and so on. It is customary, in fact, for sociology to see parents (adults) enmeshed in broad social networks of class, job, family, religion, and political party, but to see the child only in the family, as a tiny and rather motionless actor in a social matrix dominated by adults. Even the few sociological studies that seemingly focus on childhood, in actuality focus on childhood mainly as it reflects adult activities.

The child, and children's social groups and institutions, deserve sociological study in their own right. Reactions to group life and to social institutions occur early in the life cycle. In fact, as more and more women enter the labor force,early experience for children in society outside the home is becoming commonplace, and whether one reads Freud, Mead, or Erikson, the consensus is that early experience probably leaves an indelible imprint affecting all of life thereafter. Many kinds of cognitive and affective development occur early in life. An individual's assumptions about social groups and his reactions to social institutions must be shaped by early childhood experience. Children pick up a great deal of information about social life over the course of childhood, in terms of how the social system is organized and what to expect in the way of behavior from others. In school, furthermore, the child begins his lifelong vocation. Tracking in high school is one determinant of adult stratification, but actually "track" is determined long before high school, perhaps even by first grade. The kinds of concerns just expressed made us curious about the period of early elementary school when the child ventures into society on his own.

Since in the United States elementary schools are usually neighborhood schools, the introduction most children receive to learning and to academic life does not very well reflect society's commitments to equality--the school building may be as well-constructed in the inner city as in suburbia and teachers' salary scales may apply across school districts, but an elementary school in a working class neighborhood or in an inner city ghetto is just a different social institution from an elementary school in a well-to-do suburban area. At the elementary level schools in the United States are intensely parochial, and the character of the school reflects the character of the neighborhood surrounding it.

Such insularity has advantages--children can get to school easily, parents can have a voice in school policy, and the like. On the other hand such insularity causes most elementary schools to serve a special clientele--most of the children in a school come from highly similar socioeconomic and cultural backgrounds. The assumptions about what school is for, and what levels of academic achievement are likely, depend on the particular school. The elementary school may therefore be called a single social institution, but as a matter of fact, it is a multiplicity of institutions, depending on geographic location.

For a long time we have been interested in schooling in the early grades, partly because this is a time of life that sociology generally ignores. But also, as mentioned in Chapter 1, suspicion is mounting that research directed at high school students may be less than ideal if the purpose is to search for differences among schooling environments that bear an attainment . When secondary students are the focus of research and schooling, a substantial number of careful studies based on large samples agree that the influence of schools on status attainment is considerably less than the influence of background factors.

But, as many have pointed out, the criteria used for assessing school effects are narrow--achievement on standardized tests hardly reflects all, or perhaps even the most important part, of the school's effect. And it is becoming increasingly clear that the educational course a student will follow is probably determined long before secondary school; by studying only secondary students researchers may be off target in the sense that almost all the important school effects have already occurred. As we said earlier, the same parents, the same background factors, and probably even much the same kinds of peers interact with the child starting in grade school. To the extent that they do have effects, one would suspect that their effects early in a child's schooling career would outweigh later effects. As we also pointed out, the cumulative nature of schooling virtually guarantees that a child is hostage to his early attainment in reading and arithmetic. Furthermore, if the insular elementary school stamps the child, part of what secondary-school studies label as "background factors" might be better termed "elementary school" factors.

School Effects

A major purpose of this research was to examine the early schooling process in different locations. We chose schools that seemed to typify the dilemma facing society: places where equal school resources quickly prompt very different levels of children's achievement. In the two lower-class schools we studied, children's achievement by the end of third grade was about 1.5 grade equivalents below achievement in the middle-class school no matter what measure is used (see Table 5.5).

One big questions is the extent to which these outcomes are a consequence of early school experience vs. other causes such as home background.

Our data, beginning in grade one, suggest that children are not as different when they start school as indicated by the accountability data procured at the end of grade three. For example, the average IQ based on three successive cohorts was close to 100 in the integrated school in grade one (Table 5.3) and when we estimated reading achievement in that school for one cohort in second grade, it was 2.15 (Entwisle and Hayduk, 1978:118) compared to 2.75 a grade later (Table 5.6). But for making comparisons across schools in terms of absolute achievement levels our data are almost useless because three schools provide too few cases.

Process

On the other hand there is some evidence in our data that the process of schooling varies from one school to another. The validity of the basic models is indicated by many facts reviewed in Chapter 6 but there are suggestive differences among schools in how the model functions.

The average marks assigned were considerably higher in the middle-class school than in the two lower-class schools, which could be a direct consequence of IQ. But marks depended relatively more on tested IQ and on previous marks in the two lower-class schools than in the middle-class school. For example, in the second half of first grade structural coefficients linking marks at T1 with marks at T2 are two to three times as large in the integrated school as in the middle-class school.

Marks are better determined in the two lower-class schools, especially between grades. Most critical, feedback from marks is taken into account by children in the middle-class school in revising their expectations but not taken into account in the other two schools. Altogether the process of evaluation and children's reaction to evaluation looks different in different schools.

Other differences among schools, like absences and peer effects, are consistent but less coherent. There is little doubt, for example, that absences have consequences for both children's expectations and their marks in the integrated school that are not seen elsewhere. The reason behind this is not clear. It cannot be written off as a consequence of a wider sampling range because absences in the black lower-class school are almost as numerous and have almost as large a standard deviation.

Our overall impression is that the child himself is not as closely-knit into the schooling process in the two lower-class schools as compared to the middle-class school. In fact, there seems to be a mismatch between lower-class children's ideas of their own likely success in reading and arithmetic and their actual success, and relatively little influence the child can exert upon the system.

All in all, there are enough differences among schools in patterns of effects to suggest many fruitful paths for future investigation and also to suggest that the schooling process as well as educational outcomes differ from one elementary school to another. We found very little evidence of effects linked to race in the integrated school and resemblances of black children in the all-black school to blacks in the integrated school, as well as disparities between whites in the integrated school and whites in the middle-class school, point to socioeconomic status as being more important than race for explaining schooling at this age. Race may be much more critical when children attend schools outside their immediate neighborhoods for then the racial composition of the school is likely to differ from the racial composition of the neighborhood.

One outcome of schooling that has attracted a great deal of attention is a child's academic self-image. As we suggested in Chapter 2, many persons have thought that the underachievement of disadvantaged or minority-group children could be understood in these terms. A review of the literature in Chapter 2 however, suggested no predictable link between social status and self-image, except that self-image can be protected or threatened by social context.

In this study we examined young children's specific self-images in the core areas of reading and arithmetic and find that the picture is complicated. First, "self-image" is likely too broad a concept--we were forced to abandon it as an element in our models and also eventually discarded a set of other parent-reported variables designed to tap self-esteem. We did find that both parents' and children's expectations for performance in the core academic areas were sometimes mildly predictive. But the major finding is that the academic self-images seem to respond differently to evaluation in one place as compared with another. Children's own expectations were largely unresponsive to marks in the lower-class schools. Thus in terms of the schooling process, there is some evidence that differences among schools occur in how children react to evaluation, and in turn how evaluation then affects the self-image. In the lower-class schools expectations for performance did not respond to previous evaluations.

If this finding holds up it may account for some of the achievement deficit among lower-class children--they do not attend to evaluation and therefore learning may be impeded. Also it may account for the relatively high self-esteem of low SES and minority-group children--they base their academic self-image on information other than marks.

Peers

A number of persons have speculated that peers are more influential for lower-class than middle-class children. Our data generally support this opinion if we agree that our peer ratings tap what is ordinarily implied by peer influence. (We asked children to rank peers on reading and these rankings often predicted some appreciable part of achievement in arithmetic and conduct in the lower-class schools). With previous mark also a predictor, any contribution from peer ratings to marks is "excess"--mark change brought presumably about by peers. In the lower-class schools children's marks appear to respond to peers as often as to parents, but in the middle-class school marks respond more often to parents. These patterns are not as clearcut as patterns involving feedback on expectations.

Time

We earlier pointed out that a major feature of our models differing from those proposed by Finn (1972) and Braun (1976) is that expectations and achievement are modeled over time. Our models differ in this respect also from models used in studying secondary students because we sampled at many points in time rather than only two. For this reason our models may be able to capture differences in process. They also offer a method for approximating a dynamic rather than a static system (Sørenson and Hallinan, 1977). We do not have two-time-point models involving elementary school children with which to compare ours, however, so their over-time feature is hard to evaluate except in terms of the evidence they provide about feedback mechanisms, a topic already commented upon extensively in other contexts.

But besides looking at process over time, we also looked at time itself in the form of absence records. Absences were more frequent in the lower-class schools and are likely one manifestation of a lower-class milieu--reasons for absence or parents' tolerance for absence do vary by social class. (In our earlier work (Entwisle and Hayduk, 1978: 116) we showed that absences correlated with lower-class parents' expectations).

Absences were also shown repeatedly to affect performance in the integrated school, but not noticeably to affect performance in the other two schools. This inconsistency is perplexing.

A number of investigators have conjectured that students may respond to the quantity of schooling, and in trying to puzzle out how schools affect students, the idea of time spent learning or time spent receiving instruction bobs up frequently. For example, Carroll (1963) incorporated learning time directly into his model of individual pupil learning, and in the 70's, as it became increasingly apparent that the large surveys of school effects pointed to perplexingly small differences among schools, Wiley and his co-workers (Wiley, 1975; Wiley and Harnischfeger, 1974) set out to see whether, in neglecting the differences among children in time actually spent in school, survey researchers had neglected a variable of critical importance in producing school differences. Early reports by Wiley and his co-workers seemed to substantiate the importance of time spent in school. Subsequently, however, doubt has been cast on this line of inquiry. Karweit (1976, 1978) in a careful review of Wiley's data, suggests that his findings for Detroit are questionable, and in investigating data from several other sources in various locales she also does not confirm his hypothesis. However, the failure to find differences in school outcomes associated with total attendance by school does not necessarily rule out time spent in school as a possibly important variable. In the two lower-class schools effects of absence were rather different, so we are inclined to think that number of absences may be only part of the story; the other part is probably how teachers cope with absenteeism.

From observational work in these same schools (Berkeley, 1978) we have direct clues as to how absences interfere with the schooling process. When many children are absent each day the teacher may face a new class in terms of work done the day before requiring her to bring some children up to date before work can proceed. Or, on the other hand, the pace of instruction may be so slow that absence causes little disruption. If we were forced to select among explanations for absence effects or lack of effects, we would guess that absences disrupted instruction in the integrated school, were tolerable in the all-black school because the pace was slower, and had no effect in the middle-class school because they were so few in number.

Time seems to be another variable that needs to be unpackaged.

The Models

In these midrange models we attempted to include variables to represent the influence of significant others, the impact of background variables, and also the effects of early school experience. The tender age of the children being studied made it questionable at the start whether it was even possible to obtain reliable or valid measures. By careful interviewing and by trying various approaches, we finally hit upon procedures for measuring children's expectations and their peers' expectations that were fairly reliable. By re-interview and preliminary estimates of models we turned up evidence that these measures had some validity.

We expected that the data from the middle-class school would be of better quality than that from the other two schools, but that now seems doubtful. We found children's expectations to be just about as well determined one place as another, for example, and where models do not fit well, i.e. third grade, the problem seems to be across the board. Our knowledge about the black lower-class school is less complete because the case base was smaller, preventing random subsample replications for that school, and also because one of the second grade data matrices proved to be singular. Thus in addition to poor fit for third grade, we have a hiatus in the developmental sequence for this school.

On the other hand, the fit of the models and their reasonableness over the first two grades is gratifying. For exploratory work the amount of cohesion in the models is rather surprising. Starting with such models it would be possible to sample children much more representatively. For example, it should be possible now to sample children randomly within school strata (middle-class, lower-class, and so on) to see whether absences do have as different an impact over schools as our findings indicate, and to see whether feedback patterns differ across middle and lower-class schools generally, in the way we note here. Once the critical variables have been winnowed out, sampling issues can be more squarely faced. It would now be possible to design a project using a series of 2-wave panels, with each panel a representative sample over a large school population. Such samples could settle definitively whether the schooling process is as different by school in terms of early tracking and in terms of responsiveness to feedback as this research suggests.

The wisdom and the feasibility of studying very young children seems clear. For example, 7 out of 10 endogenous variables in the first cycle for the integrated school respond to sex compared to two each in the other two schools. For later cycles responses to sex are considerably less frequent. IQ effects are much more noticeable at first. Parents' effects on marks are most pronounced early on, mark persistence and expectation persistence appear early, implying that without control on prior levels of these variables, their specification in terms of "current" variables in second or third grade would be in error.

It is strange that so little research with elementary school children has attended to evaluation (marks). A mark, after all, is a distillation of a whole series of evaluations over a marking period and for this reason can serve as a proxy for feedback given the child in a more continuous basis. Probably researchers have avoided marks because marks are subjective. But as an indicator of evaluation, which is perceived by the child, rather than standardized test scores, usually not perceived by the child, marks are critical to the schooling process. Also marks preserve the classroom as the unit of analysis, a feature that is becoming increasingly attractive.

Epilogue

Why do we need a sociology of childhood? For one thing, the child's groups do not necessarily parallel adult social groups. As Coleman dramatically pointed up, a youth society differs from an adult society both in the nature and structure of its reward system. The child's work place is the school its coin is different from the coin in the larger society. For another thing, the social structure of childhood is both more vertical and more horizontal. More vertical because there are, besides parents and other relatives, teachers, principals, neighbors and even public servants (like police) who have almost unlimited power over the child. The adult may fear his boss but he has always in theory the option of quitting his job. Young children cannot escape teachers by quitting school. Horizontal because many other individuals are more nearly on an equal footing with the child--potentially all other children of the same age. Eventually the child's place in the status system will depend on the level of his educational attainment, but there is little in early childhood that makes children aware of stratification in the larger society.

One reason for studying childhood is that commonly held assumptions about adult society do not necessarily apply to the social system of youngsters. Knowledge of the society at large might lead one to expect that black children or those from working class backgrounds would hold lower opinions of themselves than economically privileged children of the majority group; the measure of the self applied by children might be thought to mirror the measure of the worth of various social groups in society as a whole. As we saw earlier, quite the contrary. Many studies suggest that self-concepts of "disadvantaged" or minority-group children are not lower than self-concepts of more privileged children. The point to be made here is that the dynamics of adult society do not necessarily carry over into societies of the very young; such societies must be studied in their own right.

Another reason to study the young is that structural features of adult society are not shared by youth's society for strong built-in insulators prevent contact between groups of children. The widest adult contact probably occurs through the world of work--the department store executive at least sees and hears the problems of the clerk; the manager of a factory has to be concerned with the janitorial staff as well as his immediate subordinates. But children travel from (highly segregated) neighborhoods to (highly segregated) neighborhood schools. Away from school they interact mostly with persons like themselves. Thus the companion group of the child is socially constricted. The child is concerned with how many children on his block, or on his street, have more or less than he has, who has the best bicycle, the best clothes, who is a better ball player, or who is more popular. The child from a low status neighborhood very rarely compares himself with better-off children across town; he compares himself with his own playmates and neighbors.

These facts of children's social life have enormous significance for the study of school attainment.

An enormous amount of effort has been devoted to research on school attainment, most of it on attainment at the secondary school level. Some curious assumptions undergird this work. One is that after nine or more years in school there is much likelihood of mobility within the system. It is true that occasionally an outstanding black athlete from a non-college preparatory curiculum moves into the college track, and also true that some people move downward out of the college track as a consequence of academic difficulty, but ability to do academic work--to read well, to study conscientiously, and the like--is not a veneer pasted on in secondary school. Rather achievement in secondary school depends on achievement in junior high and elementary school. And, as we earlier stated, the elementary school is a parochial institution. It is not comprehensive like many high schools. Children in elementary school rub shoulders mainly with others like themselves. Thus it seems possible, as this research seems to show, that the process of schooling, although modelled by similar variables, can vary considerably from one place to another; other recent research also supports the idea that some schools, or some teachers, lead to different outcomes than others.

The scholarly literature has more than its share of mushy thinking about expectations of lower-class and minority-group children, especially concerning how the expectations of such children operate to affect performance in mixed-race settings.

Our data show that blacks do not hold themselves in low regard or look for failure when they start school. Other careful research also concludes that blacks do not typically hold low self-expectations. Rosenberg and Simmons (1971), for example, reported (also for a Baltimore sample) that black children did not have low self-esteem if they were in consonant or protective settings. The integrated school we studied is probably "protective" for blacks because it has a long and successful integration history.

Minority-group children may be, and often are, unaware of society's low evaluation of the group to which they belong. Apparently young children have not yet internalized the social stigmas applied to their racial group. Lower-class children in this study had higher expectations for success in school than middle-class children, and black lower-class children's expectations turned out to be just as high as their white classmates'.

We certainly did not find low expectations to be characteristic of lower-status children.

Contrary to notions often voiced, the way to improve the school performance of groups with educational deficits (like blacks or other minorities) does not seem to be to raise children's expectation levels. Children in the present study appear to do poorly not because they thought they would do poorly, at least in first grade, but for other reasons. Unrealistically high expectations may be part of their handicap.

Such a finding about expectation levels contradicts what the "great society" thinkers of the 1960's supposed. Disadvantaged children, the thinking went, had a low sense of control because they knew that their reference groups had little control over resources or power in the larger society. Furthermore, children supposedly adopted these low expectations and acted upon them so as to fulfill the prophecy of low attainment. Our analysis suggests the opposite. Almost all the lower-class children interviewed in this study, whether black or white, started school with very high expectations. These expectations were so high that it was impossible to fulfill them. In the working-class school the system was not geared for fulfilling high expectations, even for a few children. In fact the system was not geared to fulfill even modest expectations.

The notions that "high expectations" are universally good and that "raising expectations" will make things better are absolutely contradicted by what we have observed. Children with unreasonably high expectations apparently insulated themselves from mark feedback, and marks, in turn, were relatively unresponsive to expectations.

To have expectations far above the level justified by one's performance, however, seems to disrupt the feedback system disastrously Too big a gap between low marks and high expectations is a situation with a bad prognosis. The problem is that feedback is not used; we do not know whether it is distorted, ignored, or seen as irrelevant. The data indicate that, in effect, excessively negative feedback means "no feedback".

There is considerable confusion in the public mind about subverting "academic excellence" and the use of ranked grading systems. Children, the reasoning goes, should not be given high marks unless they are really performing well. Otherwise the standards of the school will be corrupted to the eventual confusion of all. But the seventh grader who performs well is likely to be the child who has performed well in sixth grade, in fifth grade, and, indeed, all the way back to kindergarten. What led the child to "perform well" in the first place is not so clear. It is not even clear whether the same set of motivations are effective at every age.

Surely the curriculum of the early elementary school is within the mental grasp of all normal children. There is no reason to think most children cannot learn the multiplication tables or learn how to read under proper conditions. "Proper" conditions may mean being given positive evaluations in relation to one's own progress rather than in terms of arbitrary standards. In colleges and universities, adherence to marking practices based on objective standards of quality makes sense, say, for classifying future applicants to professional or graduate school. But then the learner may change courses, change schools, or drop out. It does not necessarily make sense to enforce arbitrary standards if the aim is to get a six year old to start reading and to derive enough pleasure from reading to continue to do so.

A better understanding of the schooling process, including particularly early rigidity in evaluation, may be critical for shapin children's long-term achievement. It seems clear from this research that background variables are extremely important--sex, for example, showed many effects in early first grade. But midrange studies, including the present one, suggest that there is still much more to be learned about schooling in the earliest grades. The present research testifies to both the feasibility and usefulness of studying children very early in their educational careers.

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